National Grid SA-COA
PRODUCTION FILE

Contractor : **ABB Contracting Co.**

Project : **SS 8709- 132/13.8kV in Alkharj City**

Contract No : **11131113/00**

Substation : **8709**

Subject : **132kV FOIP Panel (+FOIP)**

ABB

POWER SYSTEMS NETWORK MANAGEMENT
PROTECTION AND SUBSTATION AUTOMATION SYSTEMS
WBS NO: S-13656

ABB AUTOMATION COMPANY LTD
414, AL-KHARJ ROAD
SECOND INDUSTRIAL CITY
RIYADH-11383 K.S.A

CONTRACTOR : ABB Contracting Company

CLIENT : National GridSA

PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY

SUBSTATION : S/S 8709

CONTRACT NO. : 11131113/00

TITLE : ASSEMBLY DRAWINGS +FOIP - 132KV

REV. NO.	DATE	DESCRIPTION
Ø1	13 49	FACTORY ASBUILT
ØØ	13 04	FOR APPROVAL

AS-BUILT BY _____ DATE _____ | CONTRACT NO. 11131113/ØØ | JOB ORDER NO. S-13656

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.Ø1.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

COVER SHEET

132kV FIBER OPTIC PANEL +FOIP

S/S 87Ø9 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

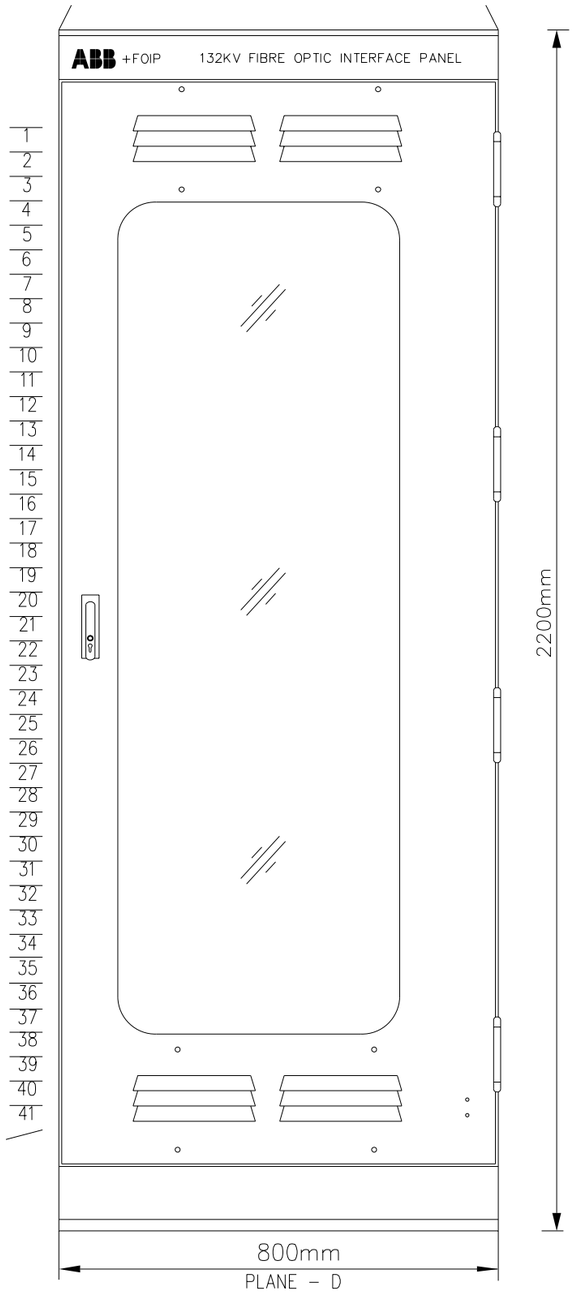
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نقل الكهرباء
National Grid SA

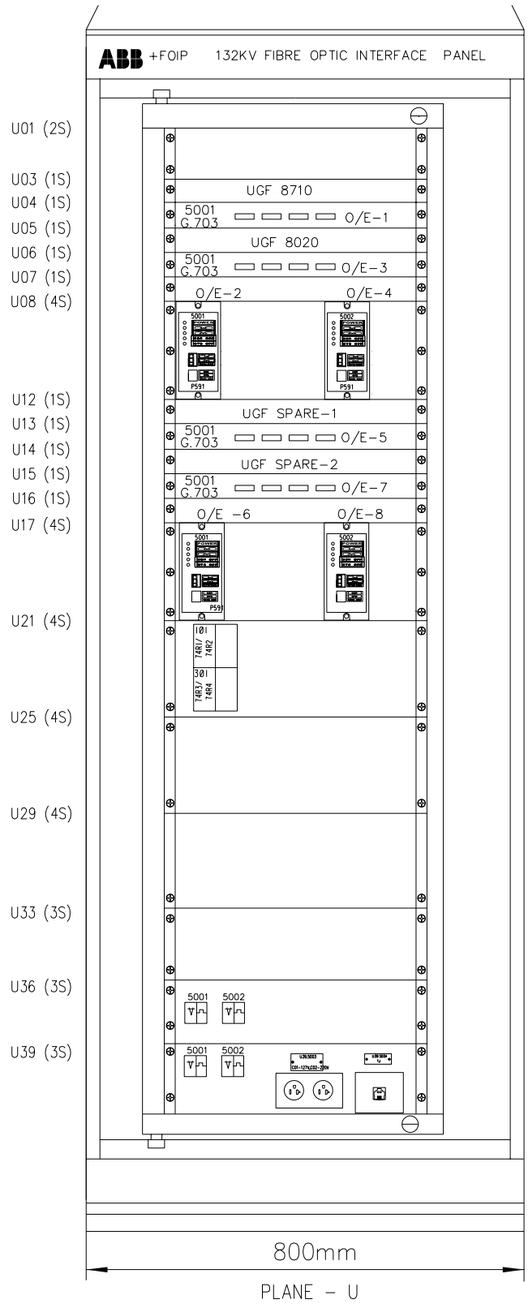
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323Ø11	GØØ	GØ1	Ø1

NG/D2-D (2Ø12/Ø1)

DMS VECTOR NGD2ØØ

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MOUNTING PLANES	
EXTERIOR COLOUR	AIRCRAFT GREY COLOUR TO SHADE NO. RAL7038
INTERIOR COLOUR	SIGNAL WHITE COLOUR TO SHADE NO. RAL9003
CUBICLE TYPE	VSH 200
FRAME	HINGED FRAME, MOVABLE
CUBICLE TYPE	FRONT ACCESS
MATERIAL OF CONSTRUCTION	FRONT ACCESS
DIMENSIONS	ALUZINK STEEL
CLASS OF PROTECTION	IP 41
APPROX WEIGHT	200KG
CABLE ENTRY	BOTTOM

REV. NO.	DATE	DESCRIPTION
Ø1	13 49	FACTORY ASBUILT
ØØ	13 04	FOR APPROVAL

AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/ØØ

JOB ORDER NO. S-13656

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.Ø1.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

ASSEMBLY DRAWING

132kV FIBER OPTIC PANEL +FOIP

S/S 87Ø9 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

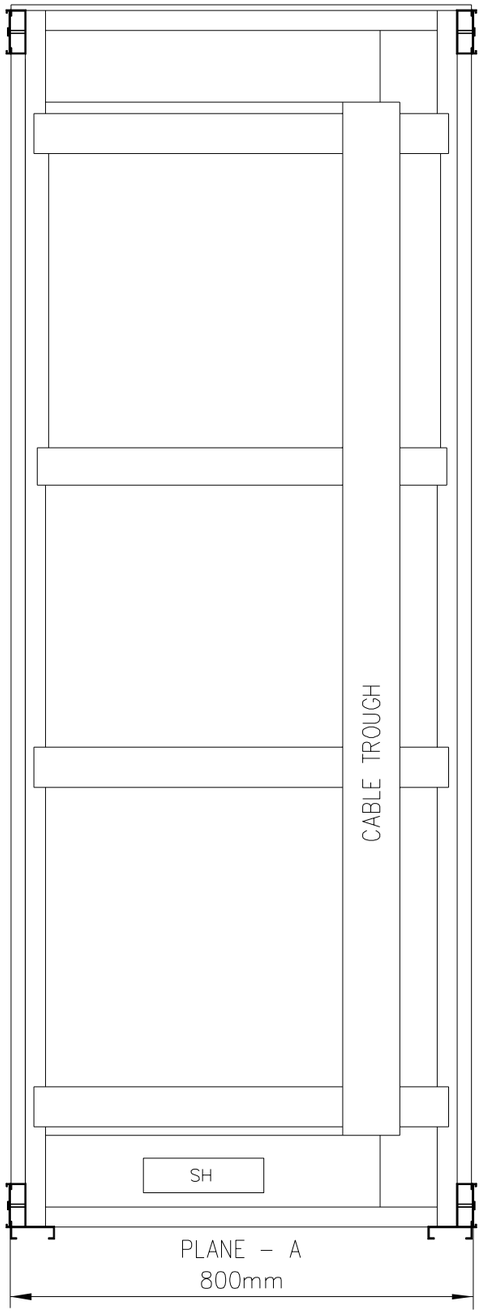
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INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323Ø11	GØ1	GØ2	Ø1

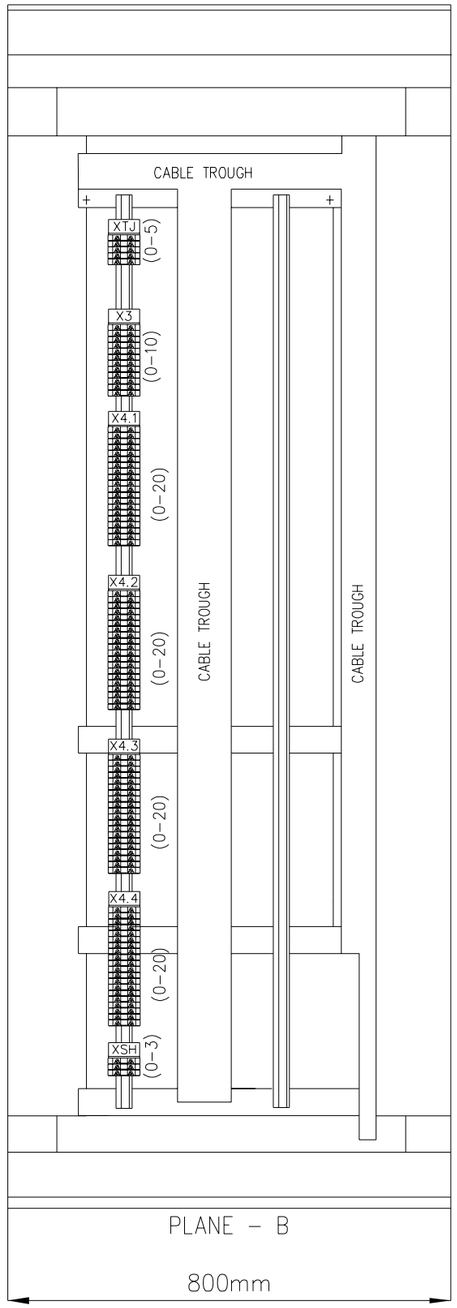
NG/D2-D (2Ø12/Ø1)

DMS VECTOR NGD2ØØ

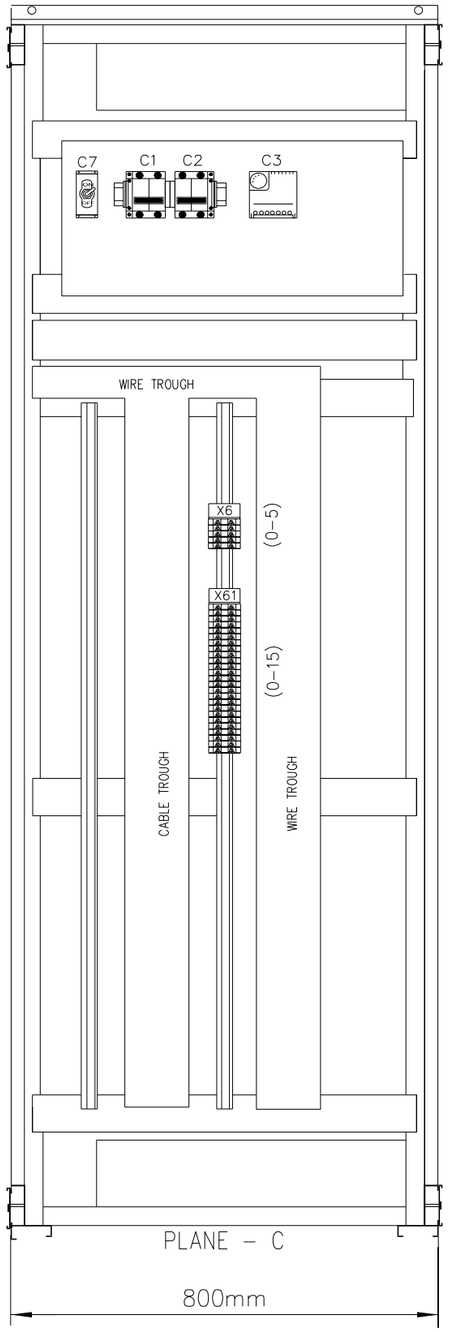
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PLANE – A
800mm



PLANE – B
800mm



PLANE – C
800mm

PLANE – B

SCH.REF	DESCRIPTION	TYPE	MAKE
X3	AC CIRCUITS	D6/8.ST1.RS	ENTRELEC
X4	DC CIRCUITS	D6/8.ST1.RS	ENTRELEC
X4.1,X4.2	DC CIRCUITS	D6/8.ST1.RS	ENTRELEC
X4.3,X4.4			
X6	COMMON ALARM CIRCUITS	M6/8.RS	ENTRELEC
XTJ	TELEPHONE JACK	M6/8.RS	ENTRELEC
XSH	SPACE HEATER	M6/8.RS	ENTRELEC

PLANE – C

SCH.REF	DESCRIPTION	TYPE	MAKE
X61	ALARM CIRCUITS	M6/8.SNB	ENTRELEC

AS-BUILT BY _____ DATE _____ | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656

REV. NO.	DATE	DESCRIPTION
Ø1	13 49	FACTORY ASBUILT
ØØ	13 Ø4	FOR APPROVAL

DRAWN BY RIZ CHECKED BY KVR
DATE STARTED 24.Ø1.2013 DATE COMPLETED _____
OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

ASSEMBLY DRAWING
132kV FIBER OPTIC PANEL +FOIP
S/S 87Ø9 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
نقل الكهرباء
National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323Ø11	GØ2	LØØ	Ø1

NG/D2-D (2Ø12/Ø1)
DMS VECTOR NGD2ØØ

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POWER SYSTEMS NETWORK MANAGEMENT
PROTECTION AND SUBSTATION AUTOMATION SYSTEMS
WBS NO: S-13656

ABB AUTOMATION COMPANY LTD
414, AL-KHARJ ROAD
SECOND INDUSTRIAL CITY
RIYADH-11383 K.S.A

CONTRACTOR : ABB Contracting Company

CLIENT : National GridSA

PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY

SUBSTATION : S/S 8709

CONTRACT NO. : 11131113/00

TITLE : LIST OF APPARATUS +FOIP - 132KV

REV. NO.	DATE	DESCRIPTION
Ø1	13 49	FACTORY ASBUILT
ØØ	13 04	FOR APPROVAL

AS-BUILT BY _____ DATE _____ | CONTRACT NO. 11131113/ØØ | JOB ORDER NO. S-13656

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.Ø1.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

COVER SHEET
132kV FIBER OPTIC PANEL +FOIP
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
نقل الكهرباء National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323Ø11	LØØ	LØ1	Ø1

NG/D2-D (2012/Ø1)
DMS VECTOR NGD200

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SR. NO.	GA. REF.	SCH. REF.	D E S C R I P T I O N	SH.NO	QTY.	TYPE	MAKE	ORDERING INFORMATION	ORIGIN OF COUNTRY
1	U04.5001	O/E-1	OPTICAL/ELECTRICAL CONVERTER FOR SHORT RANGE	221	4	C37.94 TO G703.E1	FIBER SYSTEM	1 MRK 002 245-BA	SWEDEN
	U06.5001	O/E-3	FIBRE OPTICAL MODULE X.21/G703, DATA SPEED : 2.048 MBITS/S	223					
	U13.5001	O/E-5	POWER SUPPLY : 48V DC TO 250V DC;	225					
	U15.5001	O/E-7	POWER SUPPLY : 110V AC TO 230V AC	227					
			WAVE LENGTH : 820nm;						
			OPTICAL CONNECTOR : ST;						
			TYPICAL DISTANCE : 2KM						
			OPTICAL SYSTEM BUDJECT : 13db WITH MULTIMODE FIBER (625/122Hm)						
			OPTICAL SYSTEM BUDJECT : 99db WITH MULTIMODE FIBER (50/125Hm)						
2	U08.5001	O/E-2	OPTICAL/ELECTRICAL CONVERTER FOR SHORT RANGE	222	4	P591	ALSTOM	P591602A0M0200B	UK
	U08.5002	O/E-4	FIBRE OPTICAL MODULE P591	224					
			POWER SUPPLY : 48V DC TO 250V DC;	226					
			POWER SUPPLY : 110V AC TO 230V AC	228					
			DATA SPEED : 2.048 MBITS/S;						
	U17.5001	O/E-6	WAVE LENGTH : 820nm;						
	U17.5002	O/E-8	OPTICAL CONNECTOR : ST						
			TYPICAL DISTANCE : 2KM						
			OPTICAL SYSTEM BUDJECT : 13db WITH MULTIMODE FIBER (625/122Hm)						
			OPTICAL SYSTEM BUDJECT : 99db WITH MULTIMODE FIBER (50/125Hm)						
3	U21.101	74R1/74R2,	DUAL COIL RELAY FOR 74R1/74R2 & 74R3/74R4						
	U21.301	74R3/74R4	DC SUPERVISION	235		RXSF1	ABB	RK 271 019-AN	SWEDEN
			AUXILIARY VOLTAGE : 110-125VDC						
			CONTACT DATA : 1NO + 2NC PER COIL						
			FLAG : SELF RESET						

REV. NO.	DATE	DESCRIPTION
Ø1	13 49	FACTORY ASBUILT
ØØ	13 04	FOR APPROVAL

AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/ØØ

JOB ORDER NO. S-13656

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.Ø1.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

LIST OF APPARATUS

132kV FIBER OPTIC PANEL +FOIP

S/S 87Ø9 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

نقل الكهرباء National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323Ø11	LØ1	LØ2	Ø1

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SR. NO.	GA. REF.	SCH. REF.	D E S C R I P T I O N	SH.NO	QTY.	TYPE	MAKE	ORDERING INFORMATION	ORIGIN OF COUNTRY
			MCB 2 POLE 6A, FOR DC SUPPLY						
4			WITH 2NC AUXILIARY CONTACT						
	U39.5001	Q1	R1±SUPPLY		4	S282 UC K6	ABB	GHS S282 064 R0317	
	U39.5002	Q2	R2±SUPPLY			S2-H02		GH S270 1916 R0003	
	U36.5001	Q3	R3±SUPPLY						
	U36.5002	Q4	R4±SUPPLY						
5	U39.5003	C01	CONVENIENCE OUTLET 10A, 127V AC	211	2	USM45&USMS45	LEGRAND	74140 & 74180	
		C02	CONVENIENCE OUTLET 10A, 220V AC						
6	U39.5004	TJ	TELEPHONE JACK 1GANG 4WIRE	211	2	EDF410	EDISON	EDF410	
7		C1,C2	MINIATURE CIRCUIT BREAKER, 2 POLE, 10A FOR	211	2	S202-PK10	ABB	2CDS 252 001 R0427	
			CONVENIENCE OUTLET WITH AUXILIARY SWITCH, 1NO + 1NC CONTACTS			S2C-H11L		GH 270 1917 R001	
8		C3	THERMOSTAT FOR SPACE HEATER, 5-60?C	211	1	SK 3110	RITTAL	SK 3110	
9		C7	ON/OFF SWITCH FOR SPACE HEATER	211	1	M2SS1-10B	ABB	1SFA 611 200 R1006	
						MCBH-10		1SFA 611 605 R1101	
		DS	DOOR SWITCH FOR CONTROL OF CUBICLE INTERNAL ILLUMINATION LAMP	211	1	LS30P	ABB	1SBV 010 213 R1202	
		IL	INTERNAL ILLUMINATION CUBICLE LAMP SUITABLE FOR	211	1	T4	SUNON	SP-20W	
			127V AC, 60Hz SUPPLY						
		SH	SPACE HEATER, 150W, 120V, 60Hz	211	1	RICA	GRUPPO	1FZEK006C001	

REV. NO.	DATE	DESCRIPTION
Ø1	13 49	FACTORY ASBUILT
ØØ	13 04	FOR APPROVAL

AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/ØØ

JOB ORDER NO. S-13656

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.Ø1.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

LIST OF APPARATUS

132kV FIBER OPTIC PANEL +FOIP

S/S 87Ø9 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

نقل الكهرباء National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323Ø11	LØ2	LØ3	Ø1

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SR. NO.	GA. REF.	SCH. REF.	D E S C R I P T I O N	SH.NO	QTY.	TYPE	MAKE	ORDERING INFORMATION	COUNTRY OF ORIGIN
10		X3	TERMINAL BLOCK SPRING LOADED FOR AC CIRCUIT	301	10	D6/8.ST1.RS	ENTRELEC	1SNA 115 831 R0400	
		X4.1,X4.2	SPRING LOADED TERMINAL BLOCK FOR DC INCOMING. CIRCUITS	301	20,20	D6/8.ST1.RS	ENTRELEC	1SNA 115 831 R0400	
		X4.3,X4.4	SPRING LOADED TERMINAL BLOCK FOR DC INCOMING. CIRCUITS	301	20,20	D6/8.ST1.RS	ENTRELEC	1SNA 115 831 R0400	
		X6	SPRING LOADED TERMINAL BLOCK FOR STN COM	301	5	M6/8.RS	ENTRELEC	1SNA 115 685 R1200	
		X61	KNIFE TYPE TERMINAL BLOCKS DISCONNECTIBLE	301	15	M6/8.SNB	ENTRELEC	1SNA 115 688 R2500	
			FOR STN.–COM ALARM CIRCUITS						
		XTJ	SPRING LOADED TERMINAL BLOCK KNIFE TYPE FOR TELEPHONE JACK	301	5	M6/8.RS	ENTRELEC	1SNA 115 685 R1200	
		XSH	SPRING LOADED TERMINAL BLOCKS FOR SPACE HEATER	301	3	M6/8.RS	ENTRELEC	1SNA 115 685 R1200	

AS-BUILT BY _____ DATE _____ | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656

REV. NO.	DATE	DESCRIPTION
01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.01.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

LIST OF APPARATUS

132kV FIBER OPTIC PANEL +FOIP

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

نقل الكهرباء National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323011	L03	NIL	01

NG/D2-D (2012/01)

DMS VECTOR NGD200

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POWER SYSTEMS NETWORK MANAGEMENT
PROTECTION AND SUBSTATION AUTOMATION SYSTEMS
WBS NO: S-13656

ABB AUTOMATION COMPANY LTD.
414, AL-KHARJ ROAD
SECOND INDUSTRIAL CITY
RIYADH-11383 K.S.A

CONTRACTOR : ABB Contracting Company

CLIENT : National GridSA

PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY

SUBSTATION : S/S 8709

CONTRACT NO. : 11131113/00

TITLE : SHEMATIC DRAWINGS +FOIP - 132KV

REV. NO.	DATE	DESCRIPTION
01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL

AS-BUILT BY _____ DATE _____ | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.01.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

COVER SHEET

132kV FIBER OPTIC PANEL +FOIP

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

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نقل الكهرباء
National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323012	000	001	01

NG/D2-D (2012/01)

DMS VECTOR NGD200

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CONTENTS	ABB SH.NO.	REV.
COVER SHEET	000	01
CONTENTS SHEET	001	01
GRAPHICAL SYMBOLS FOR DIAGRAMS	011	01
GRAPHICAL SYMBOLS FOR DIAGRAMS	012	01
COMMON LEGEND	013	01
FERRULE AND WIRING DETAILS	014	01
DRAWING REFERENCES	015	01
DRAWING REFERENCES	016	01
AC SUPPLY DISTRIBUTION	211	01
AC MCB AUX CONTACTS	212	01
DC SUPPLY DISTRIBUTION	216	01
COMMUNICATION INTERFACE-UGF 8710	221-222	01
COMMUNICATION INTERFACE-UGF 8020	223-224	01
COMMUNICATION INTERFACE-UGF SPARE-1	225-226	01
COMMUNICATION INTERFACE-UGF SPARE-2	227-228	01
COMMUNICATION INTERFACE-UGF 8710 & 8020	229	01
COMMUNICATION INTERFACE-UGF SPARE-1 & 2	230	01
MEDIA CONVERTER ROUTING CABLE FORM (8710 , 8020)	233	01
MEDIA CONVERTER ROUTING CABLE FORM (SPARE-1,SAPRE-2 UGF)	234	01
DC SUPPLY SUPERVISION CIRCUIT	235	01
COMMON ALARM CONTACTS	236	01
TERMINAL BLOCK ALLOCATION	301	01

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AS-BUILT BY _____ DATE _____ | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656

REV. NO.	DATE	DESCRIPTION
01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL

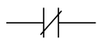
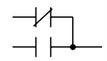
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DATE STARTED 24.01.2013 DATE COMPLETED _____
OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

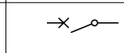
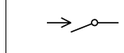
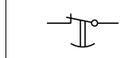
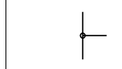
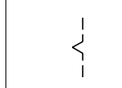
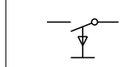
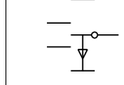
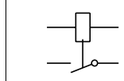
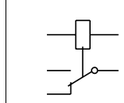
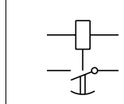
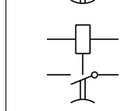
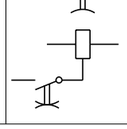
CONTENTS SHEET
132kV FIBER OPTIC PANEL +FOIP
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

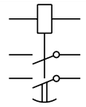
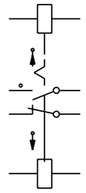
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نقل الكهرباء National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323012	001	011	01

NG/D2-D (2012/01)
DMS VECTOR NGD200

SYMBOL	DESCRIPTION
	FRAME CONNECTION
	EARTH CONNECTION
	RESISTOR
	VARIABLE RESISTOR
	RESISTOR WITH PRESET ADJUSTMENT
	CAPACITOR
	SEMICONDUCTOR DIODE USED AS A CAPACITIVE DEVICE
	OPEN CONTACT, MAKE CONTACT
	CLOSED CONTACT, BREAK CONTACT
	CHANGE-OVER CONTACT, BREAK BEFORE MAKE
	MAKE CONTACT WHICH IS EARLY WHEN OPERATING AND LATE WHEN RELEASING
	BREAK CONTACT WHICH IS LATE WHEN OPERATING AND EARLY WHEN RELEASING
	SWITCHING DEVICE WITH MANUAL CONTROL
	MAKE CONTACT DELAYED WHEN OPERATING
	BREAK CONTACT DELAYED WHEN RELEASING
	MAKE CONTACT DELAYED WHEN OPERATING AND RELEASING
	MAIN CONTACT OF A SWITCH DISCONNECTOR
	MAIN CONTACT OF A DISCONNECTOR

SYMBOL	DESCRIPTION
	MAIN CONTACT OF A CIRCUIT BREAKER
	PASSING MAKE CONTACT CLOSING MOMENTARILY DURING OPERATION AND RELEASE
	BREAK CONTACT DELAYED WHEN OPERATING
	MAKE CONTACT DELAYED WHEN RELEASING
	TWO MECHANICAL LINKS CROSSING WITHOUT CONNECTION
	JUNCTION OF MECHANICAL LINKS
	AUTOMATIC RESET
	NON-AUTOMATIC RESET
	SWITCHING DEVICE WITH MANUAL OPERATION AND WITH AUTOMATIC RESET
	SWITCHING DEVICE WITH MANUAL OPERATION AND WITH NON-AUTOMATIC RESET
	CHANGE-OVER SWITCHING DEVICE WITH MANUAL CONTROL AUTOMATIC RESET FROM POSITION 1-2 TO THE NEUTRAL POSITION
	RELAY WITH MAKE CONTACT
	RELAY WITH CHANGE-OVER CONTACT
	RELAY WITH MAKE CONTACT, DELAYED WHEN OPERATING
	RELAY WITH MAKE CONTACT, DELAYED WHEN RELEASING
	RELAY WITH MAKE CONTACT, DELAYED WHEN OPERATING AND RELEASING

SYMBOL	DESCRIPTION
	RELAY WITH TWO MAKE CONTACTS, ONE OF THEM DELAYED WHEN OPERATING
	RELAY WITH TWO ACTUATORS AND A TWO STABLE POSITIONS
	SIGNALLING LAMP
	MECHANICAL INDICATOR WITH AUTOMATIC RESET
	MECHANICAL INDICATOR WITH NON-AUTOMATIC RESET
	ELECTRICALLY CONTROLLED MECHANICAL INDICATOR WITH AUTOMATIC RESET
	ELECTRICALLY CONTROLLED MECHANICAL INDICATOR WITH NON-AUTOMATIC RESET
	RELAY WITH MECHANICAL INDICATOR
	ELECTRO-MECHANICAL POSITION INDICATOR WITH ONE DE-ENERGIZED AND ONE OPERATED POSITION
	ELECTRO-MECHANICAL POSITION INDICATOR WITH ONE DE-ENERGIZED AND TWO OPERATED POSITION
	BELL, BUZZER
	SIREN , HORN

AS-BUILT BY _____ DATE _____	CONTRACT NO. 11131113/00	JOB ORDER NO. S-13656	GRAPHICAL SYMBOLS FOR DIAGRAMS
			132kV FIBER OPTIC PANEL +FOIP
			S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
			RIYADH SAUDI ARABIA

REV. NO.	DATE	DESCRIPTION
01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL

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DATE STARTED 24.01.2013 DATE COMPLETED _____

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INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323012	011	012	01

NG/D2-D (2012/01)

DMS VECTOR NGD200

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SYMBOL	DESCRIPTION
	FUSE / LINK
	FUSE WITH THE SUPPLY SIDE INDICATED
	SINGLE-PHASE TRANSFORMER WITH TWO SEPARATE WINDINGS (TWO ALTERNATIVE FORMS)
	SINGLE-PHASE TRANSFORMER WITH THREE SEPARATE WINDINGS (TWO ALTERNATIVE FORMS)
	SINGLE-PHASE TRANSFORMER WITH FERRO MAGNETIC CORE
	SINGLE-PHASE VOLTAGE TRANSFORMER (MULTI-LINE AND SINGLE-LINE REPRESENTATION)
	SINGLE-PHASE VOLTAGE TRANSFORMER WITH TWO SECONDARY WINDINGS (MULTI-LINE AND SINGLE-LINE REPRESENTATION)
	CURRENT TRANSFORMER (MULTI-LINE AND SINGLE-LINE REPRESENTATION)
	CURRENT TRANSFORMER WITH TWO CORES (MULIT-LINE AND SINGLE-LINE REPRESENTATION)
	CURRENT TRANSFORMER WITH TWO SECONDARY WINDINGS ON ONE CORE (MULTI-LINE AND SINGLE-LINE REPRESENTATION)
~	FILTER
	HIGH-PASS FILTER
	BAND-PASS FILTER
V	VOLTMETER
A	AMMETER

SYMBOL	DESCRIPTION
W	WATTMETER
Var	VARMETER
PF	POWER FACTOR METER
	POSITION INDICATOR
	SYNCHROSCOPE
V	RECORDING VOLTMETER
W	RECORDING WATTMETER
h	HOUR METER
Wh	WATT-HOUR METER
Wh	WATT-HOUR METER FOR ENERGY FROM A BUSBAR SYSTEM
	ELEMENT WITH STATIC INPUT
	ELEMENT WITH STATIC NEGATED INPUT
	ELEMENT WITH STATIC NEGATED OUTPUT
	ELEMENT WITH DYNAMIC INPUT
	ELEMENT WITH DYNAMIC NEGATED INPUT
	ELEMENT WITH INHIBITING INPUT

SYMBOL	DESCRIPTION
	ELEMENT WITH NEGATED INHIBITING INPUT
	ELEMENT WITH INPUT WHICH DOES NOT CARRY ANY LOGIC INFORMATION
X1	ELEMENT WITH POSTPONED OUTPUT
&	AND-ELEMENT WITH TWO INPUTS
≥1	OR-ELEMENT WITH TWO INPUTS
≥2	LOGIC THRESHOLD ELEMENT WITH FOUR INPUTS AND THRESHOLD VALUE 2
=2	ELEMENT WITH THREE INPUTS FOR "2 AND ONLY 2"
=1	EXCLUSIVE OR-ELEMENT WITH THREE INPUTS
=	LOGIC IDENTITY ELEMENT WITH THREE INPUTS
>n/2	MAJORITY ELEMENT WITH THREE INPUTS
1	NEGATOR
&	NAND ELEMENT WITH TWO INPUTS
≥1	NOR ELEMENT WITH TWO INPUTS
X Y	BISTABLE ELEMENT

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REV. NO.	DATE	DESCRIPTION
Ø1	13 49	FACTORY ASBUILT
ØØ	13 Ø4	FOR APPROVAL

AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/ØØ

JOB ORDER NO. S-13656

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DATE STARTED 24.Ø1.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

GRAPHICAL SYMBOLS FOR DIAGRAMS

132kV FIBER OPTIC PANEL +FOIP

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

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نقل الكهرباء National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323Ø12	Ø12	Ø13	Ø1

NG/D2-D (2Ø12/Ø1)

DMS VECTOR NGD2ØØ

LEGENDS

± R1	DC SUPPLY - MAIN PROTECTION / TCS
± R2	DC SUPPLY - SECONDARY PROTECTION / TCS
± R3	DC SUPPLY - BACK UP PROTECTION
± IT	DC SUPPLY - INTER TRIP
± S1	DC SUPPLY - ALARM UNIT - 1
± S2	DC SUPPLY - ALARM UNIT - 2 INTERROGATION VOLTAGE
± S3	DC SUPPLY - ALARM UNIT - 3
± S4	DC SUPPLY - ALARM UNIT - 4
ISC ±	DC SUPPLY - INDICATIONS IN CONTROL PANEL
ISCL	DC SUPPLY - LAMP TEST IN CONTROL PANEL
ISR ±	DC SUPPLY - INDICATIONS IN RELAY PANEL
ISRL	DC SUPPLY - LAMP TEST IN RELAY PANEL
FL	DC SUPPLY - FLASHING CIRCUIT
BB RS ±	DC SUPPLY - BUS BAR - PROTECTION RESET
BB CBF ±/CBF ±	DC SUPPLY - CBF PROTECTION
FR1 ±	DC SUPPLY - FAULT RECORDER - 1
FR2 ±	DC SUPPLY - FAULT RECORDER - 2
AN ±	DC SUPPLY - ALARM UNITS
AD	ACKNOWLEDGE BUS - ALARM SYSTEM
R	RESET BUS - ALARM SYSTEM
CR	CONTROL ROOM
NCC	NATIONAL CONTROL CENTRE
LOCAL	THE LOCATION OF CONTROLLED DEVICE
REMOTE	ANY OTHER LOCATION NOT LOCAL
XNCC	CB / ISOLATOR ZYX - CONTROL COMMON TO NCC
XNCCC	CB / ISOLATOR ZYX - CONTROL CLOSE FROM NCC
XNCCO	CB / ISOLATOR ZYX - CONTROL OPEN FROM NCC
XCR	CB / ISOLATOR ZYX - OPERATION FROM CONTROL ROOM
XRC	CB / ISOLATOR ZYX - CLOSE FROM REMOTE
XRO	CB / ISOLATOR ZYX - OPEN FROM REMOTE
XRCT	CB ZYX - REMOTE CLOSE "TEST" POSITION
XRCS	CB ZYX - REMOTE CLOSE "SERVICE" POSITION
XRO	CB ZYX - REMOTE OPEN
XCRO	CB ZYX - OPEN FROM CONTROL ROOM
XCRC	CB ZYX - CLOSE FROM CONTROL ROOM

(ZYX - DENOTES DEVICE NO e.g. 134,136 OR 130 ETC.
Ex: 34NCCC DENOTES CLOSING OF ISOLATOR 134 FROM NCC)
30CRC DENOTES CB 130 CLOSE COMMAND FROM CONTROL ROOM)

ON	CB NORMALLY OPEN AUXILIARY CONTACT
OFF	CB NORMALLY CLOSED AUXILIARY CONTACT
A	COMMON
T	TEST POSITION
S	SERVICE POSITION
CS	CLOSE IN SERVICE POSITION
CT	CLOSE IN TEST POSITION
LS	LOCAL SERVICE
LT	LOCAL TEST
LC	LOCAL CLOSE
LO	LOCAL OPEN
RO	REMOTE OPEN

REV. NO.	DATE	DESCRIPTION
01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL

AS-BUILT BY _____ DATE _____ | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656

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COMMON LEGENDS
132kV FIBER OPTIC PANEL +FOIP
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

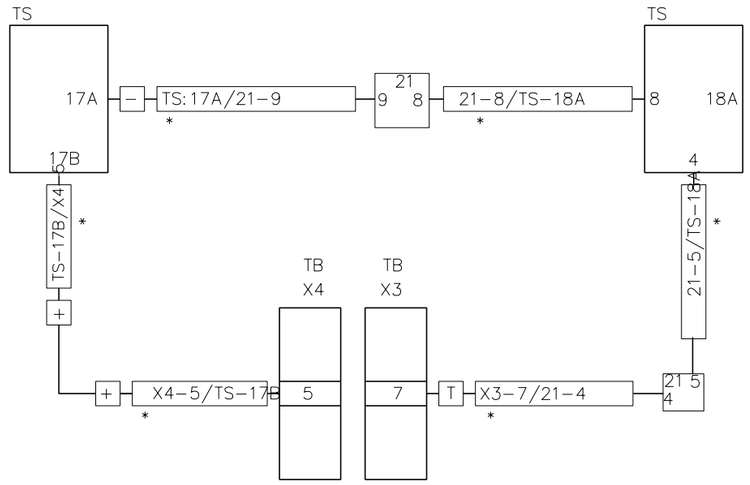
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INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323012	013	014	01

NG/D2-D (2012/01)
DMS VECTOR NGD200

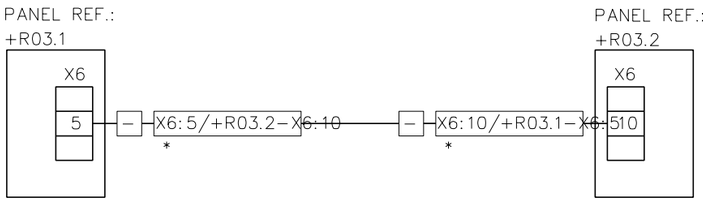
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FOR 132kV RELAY & CONTROL, PROTN. PANELS



AS PER IEC-391 FIG 14a (W/O SUPPLEMENTARY/IDENTIFICATION MARK)

FOR 132kV PANELS INTERPANEL WIRING



AS PER IEC-391 FIG 14d (W/O SUPPLEMENTARY/IDENTIFICATION MARK)

WIRES – PVC insulated,stranded, coaled annealed copper conductor graded for 1000V	a. CT Circuits – 2.5 Sqmm PVC Yellow colour
	b. VT Circuits – 1.5 Sqmm PVC Red colour
	c. DC, & CONTROL Circuits – 1.5 Sqmm PVC Grey colour
	d. Alarm Circuits – 1.0 Sqmm PVC Blue colour
	e. AVC & AC Circuits – 2.5 Sqmm PVC Black colour
	f. Earth Circuits – 2.5 Sqmm PVC Yellow/Green colour
LUGS – Pre-Insulated	a(CT Circuits – Ring type
	b(Other Circuits – Spade type

NOTE:1 ADDITIONAL MARKING AS APPLICABLE

NOTE:2 FERRULE NUMBERING WILL BE BLACK LETTERS ON YELLOW TUBE

3.2 mm for 1.5 sq mm wires and

4.2 mm for 2.5 sq mm wires

(As per 31-TMSS-1, REV 0)

NOTE:3 STARTING POINT OF THE FERRULE LEFT TO RIGHT

REV. NO.	DATE	DESCRIPTION
Ø1	13 49	FACTORY ASBUILT
ØØ	13 Ø4	FOR APPROVAL

AS-BUILT BY _____ DATE _____ | CONTRACT NO. 11131113/ØØ | JOB ORDER NO. S-13656

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OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

FERRULE AND WIRING DETAILS

132kV FIBER OPTIC PANEL +FOIP

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

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نقل الكهرباء National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323Ø12	Ø14	Ø15	Ø1

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MANUFACTURER	SCHEMATICS DWG.NO	PANEL DESCRIPITION	PANEL REFERENCE
		SS 8709 132kV RELAY PANELS	
	CD-322928	132/13.8kV GT-1 RELAY PANEL -1	+R05.1
		132/13.8kV GT-1 RELAY PANEL -2	+R05.2
	CD-322931	132/13.8kV GT-2 RELAY PANEL -1	+R01.1
		132/13.8kV GT-2 RELAY PANEL -2	+R01.2
	CD-322934	132/13.8kV GT-3 RELAY PANEL -1	+R04.1
		132/13.8kV GT-3 RELAY PANEL -2	+R04.2
	CD-322936	132/13.8kV TRANSFORMER-1,2& 3 AVC PANEL	+AVC
	CD-322922	132KV SPARE-1 UGF RELAY PANEL -1	+R07.1
		132KV SPARE-1 UGF RELAY PANEL -2	+R07.2
	CD-322916	132KV 8020 UGF RELAY PANEL -1	+R02.1
		132KV 8020 UGF RELAY PANEL -2	+R02.2
	CD-322919	132KV 8710 UGF RELAY PANEL -1	+R03.1
		132KV 8710 UGF RELAY PANEL -2	+R03.2
	CD-322925	132KV SPARE-2 UGF RELAY PANEL -1	+R06.1
		132KV SPARE-2 UGF RELAY PANEL -2	+R06.2
	CD-323012	132KV FOIP PANEL	+FOIP
	CD-322946	132kV BUS COUPLER-A	+R130
	CD-322948	132kV BUS COUPLER-B	+R230
	CD-322950	132kV BUS SECTION	+R120
	CD-322991	132kV BUSBAR PROTECTION MAIN-1 CENTRAL UNIT PANEL	+BB1-1
	CD-322993	132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL	+BB1-2
	CD-322995	132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL	+BB1-3
	CD-322997	132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL	+BB1-4
	CD-322999	132kV BUSBAR PROTECTION MAIN-1 BAY UNIT PANEL	+BB1-5
	CD-323001	132kV BUSBAR PROTECTION MAIN-2 CENTRAL UNIT PANEL	+BB2-1
	CD-323003	132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL	+BB2-2
	CD-323005	132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL	+BB2-3
	CD-323007	132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL	+BB2-4
	CD-323009	132kV BUSBAR PROTECTION MAIN-2 BAY UNIT PANEL	+BB2-5

ABB

PROTECTION & SUBSTATION AUTOMATION

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AS-BUILT BY _____ DATE _____ | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656

REV. NO.	DATE	DESCRIPTION
01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.01.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

DRAWING REFERENCES

132kV FIBER OPTIC PANEL +FOIP

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

نقل الكهرباء National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323012	015	016	01

NG/D2-D (2012/01)

DMS VECTOR NGD200

MANUFACTURER	SCHEMATICS DWG.NO	PANEL DESCRIPITION	PANEL REFERENCE
ABB PROTECTION & SUBSTATION AUTOMATION		SS 8709 13.8KV RELAY PANELS	
	CD-322952	13.8KV Capacitor Bank-1 Protection Panel	+CBP-1
	CD-322954	13.8KV Capacitor Bank-2 Protection Panel	+CBP-2
	CD-322956	13.8KV Capacitor Bank-2 Protection Panel	+CBP-3
	CD-322958	13.8 KV ACCS PANEL	+ACCS
	CD-322962	13.8KV ACSE PANEL	+ACSE
	CD-322968	13.8KV Under Voltage Load Shedding Panel	+UVLS
	CD-322964	13.8KV Under Frequency Load Shedding Panel-1	+UFLS01
	CD-322966	13.8KV Under Frequency Load Shedding Panel-2	+UFLS02

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AS-BUILT BY _____ DATE _____ | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656

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01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL

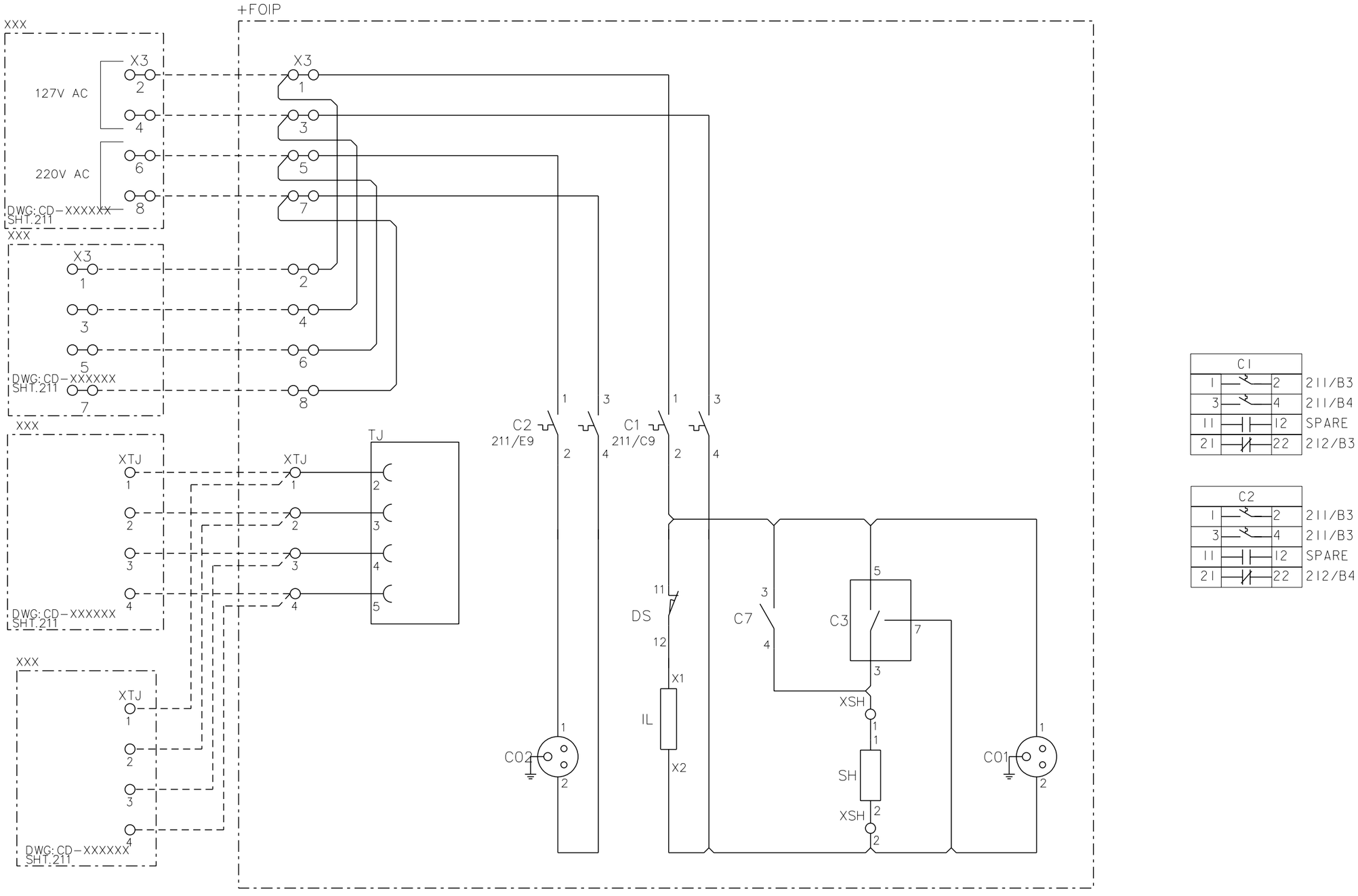
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DRAWING REFERENCES
132kV FIBER OPTIC PANEL +FOIP
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
نقل الكهرباء National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323012	016	211	01

NG/D2-D (2012/01)
DMS VECTOR NGD200



C1			
1		2	211/B3
3		4	211/B4
11		12	SPARE
21		22	212/B3

C2			
1		2	211/B3
3		4	211/B3
11		12	SPARE
21		22	212/B4

AS-BUILT BY _____ DATE _____ | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656

REV. NO.	DATE	DESCRIPTION
01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL

DRAWN BY RIZ CHECKED BY KVR
DATE STARTED 24.01.2013 DATE COMPLETED _____
OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

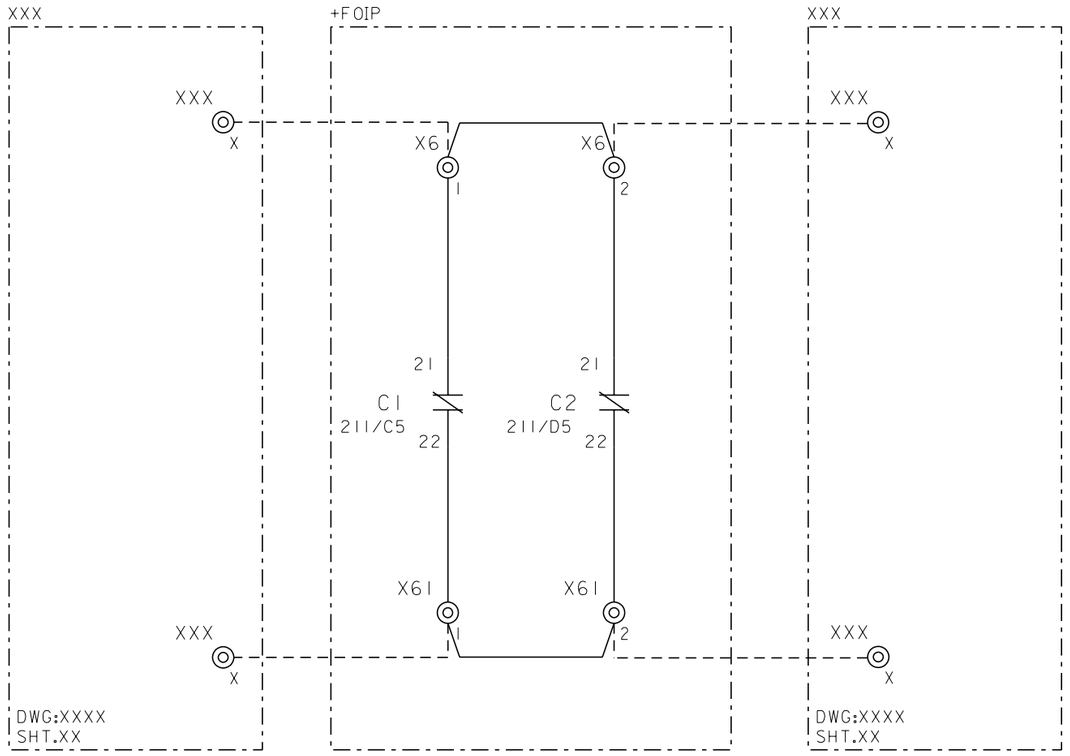
AC SUPPLY DISTRBUTION
132kV FIBER OPTIC PANEL +FOIP
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

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نقل الكهرباء
National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323012	211	212	01

NG/D2-D (2012/01)
DMS VECTOR NGD200

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AS-BUILT BY _____ DATE _____ | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656

REV. NO.	DATE	DESCRIPTION
Ø1	13 49	FACTORY ASBUILT
ØØ	13 04	FOR APPROVAL

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.Ø1.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

AC MCB AUX CONTACTS.

132kV FIBER OPTIC PANEL +FOIP

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

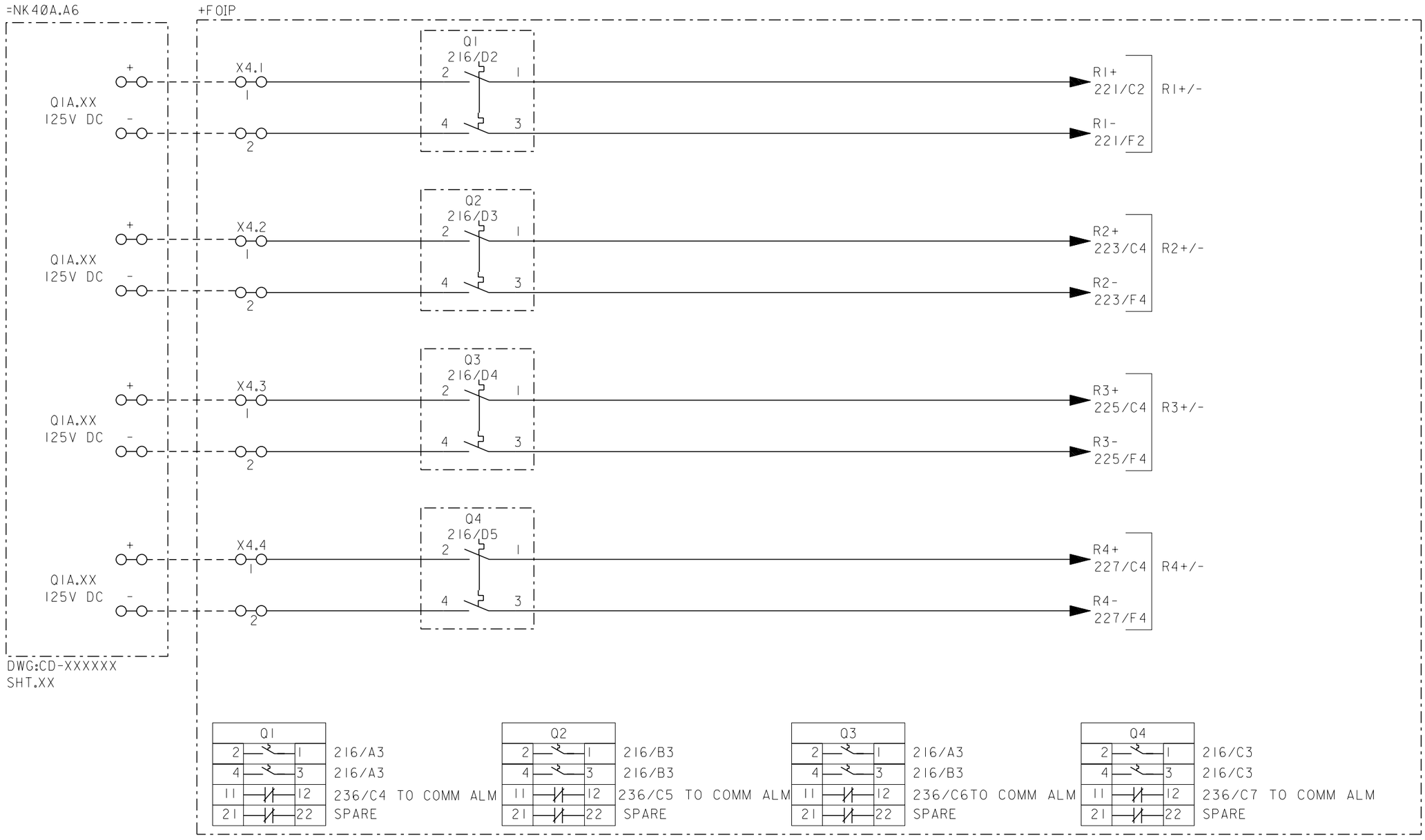
الشركة الوطنية لنقل الكهرباء

نقل الكهرباء National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323Ø12	212	216	Ø1

NG/D2-D (2012/Ø1)

DMS VECTOR NGD2ØØ



REV. NO.	DATE	DESCRIPTION
Ø1	13 49	FACTORY ASBUILT
ØØ	13 Ø4	FOR APPROVAL

AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/ØØ

JOB ORDER NO. S-13656

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.Ø1.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

DC SUPPLY DISTRBUTION

132kV FIBER OPTIC PANEL +FOIP

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

نقل الكهرباء National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323Ø12	216	221	Ø1

NG/D2-D (2Ø12/Ø1)

DMS VECTOR NGD2ØØ

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CABLE DIFFL. PROTECTION
COMMUNICATION INTERFACE

S/S 8709

+R03.1
87L–1 RED670

RX1
TX1
RX2
TX2

SHT.298
DWG.CD–322919, SH.246

MULTI MODE DUPLEX 850mm

CH–2
MDF

+FOIP

+R1 216/A8
+R1 222/A3

X4.1 5 6

O/E CONV. O/E–1
Tx
O/ECONV.
PS
Rx
(G703) K1

X4.1 7 8

–R1 216/A8
–R1 222/C3

OPTICAL TO ELECTRICAL CONVERTER

G.703 SIGNAL
REF. DWG. COMM. EQPT.

F.O
F.O
SINGLE MODE 1350mm

REMOTE END S/S 8710

REF. DWG. COMM. EQPT.
G.703 SIGNAL

+FOIP

+R1 222/A7

X4 5 6

O/E–1 O/E CONV.
Tx
O/ECONV.
PS
Rx
(G703) K1

X4 7 8

–R1
–R1 222/C7

OPTICAL TO ELECTRICAL CONVERTER

DWG.CD–XXXXXX, SH.XXX

CH–2
MDF

MULTI MODE DUPLEX 850mm

+R0X.X
87L–I RED670

RX1
TX1
299A/C3
TX2
RX2

SHT.298
DWG.CD–XXXXXX, SH.XXX

REV. NO.	DATE	DESCRIPTION
Ø1	13 49	FACTORY ASBUILT
ØØ	13 Ø4	FOR APPROVAL

AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/ØØ

JOB ORDER NO. S-13656

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.Ø1.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

COMMUNICATION INTERFACE-UGF 8710
132kV FIBER OPTIC PANEL +FOIP
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

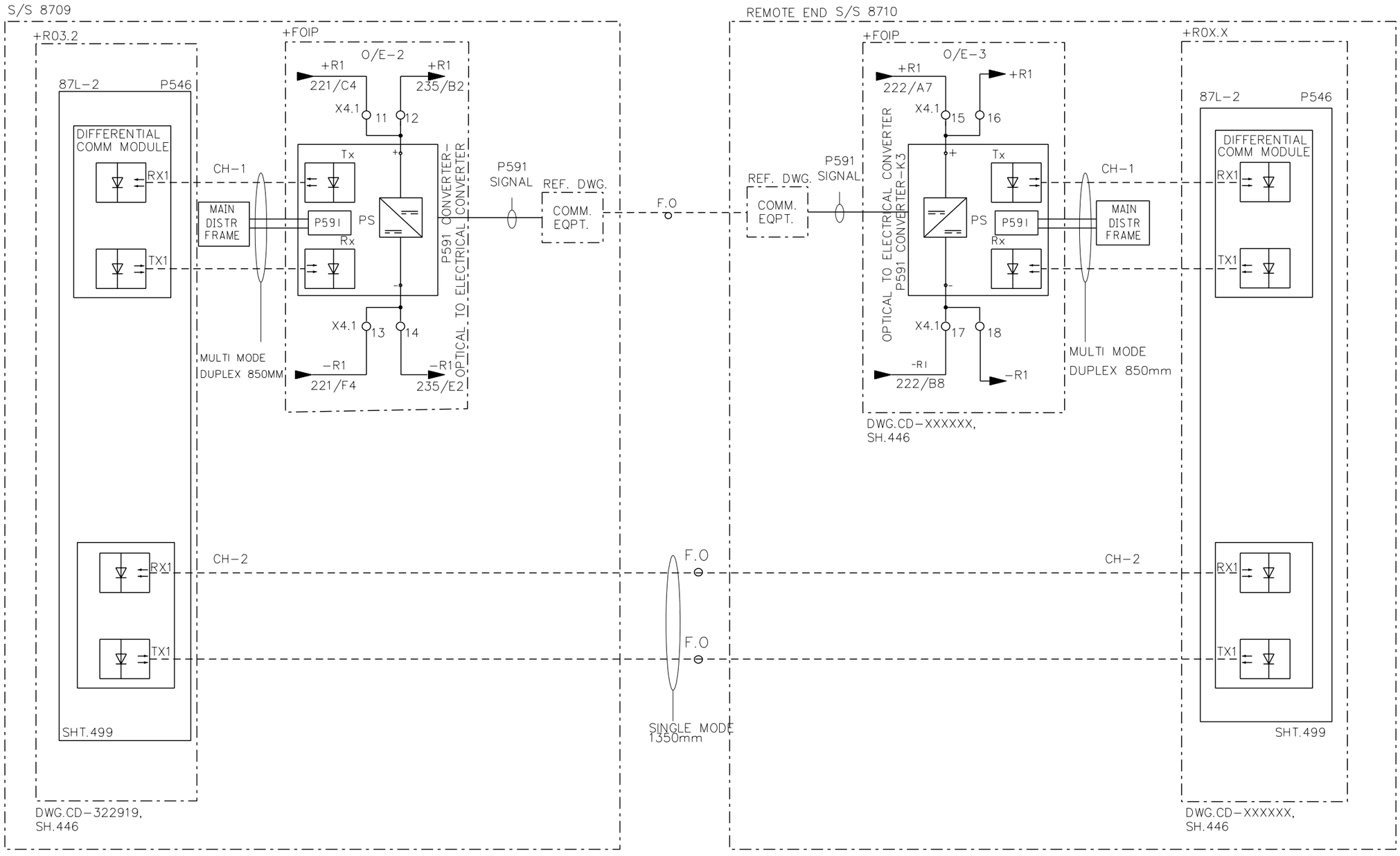
الشركة الوطنية لنقل الكهرباء
نقل الكهرباء
National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323Ø12	221	222	Ø1

NG/D2-D (2Ø12/Ø1)
DMS VECTOR NGD2ØØ

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CABLE DIS/DEF. PROTECTION
COMMUNICATION INTERFACE



REV. NO.	DATE	DESCRIPTION
Ø1	13 49	FACTORY ASBUILT
ØØ	13 04	FOR APPROVAL

AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/ØØ

JOB ORDER NO. S-13656

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.Ø1.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

COMMUNICATION INTERFACE-UGF 8710
132kV FIBER OPTIC PANEL +FOIP
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
نقل الكهرباء
National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323Ø12	222	223	Ø1

NG/D2-D (2Ø12/Ø1)
DMS VECTOR NGD2ØØ

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CABLE DIFFL. PROTECTION
COMMUNICATION INTERFACE

S/S 8709

+R02.1
87L–1 RED670

RX1
TX1
RX2
TX2

MULTI MODE
DUPLEX 850mm

SHT.298
DWG.CD–322916,
SH.246

+FOIP

+R2
216/B8

+R2
224/A3

X4.2 5 6

O/E CONV. O/E–3
Tx
Rx
PS
O/ECONV.
(G703)

CH–2
MDF

OPTICAL TO ELECTRICAL CONVERTER

G.703 SIGNAL
REF. DWG.
COMM. EQPT.

X4.2 7 8

–R2
216/B8

–R2
224/C3

F.O
F.O
SINGLE MODE
1350mm

REMOTE END S/S 8020

+FOIP

+R2
224/A7

X4 5 6

O/E–4 O/E CONV.
Tx
Rx
PS
O/ECONV.
(G703) K4

CH–2
MDF

OPTICAL TO ELECTRICAL CONVERTER

REF. DWG.
COMM. EQPT.
G.703 SIGNAL

X4 7 8

–R2
224/C7

DWG.CD–XXXXXX, SH.XXX

+R0X.X
87L–I RED670

RX1
TX1
TX2
RX2

MULTI MODE
DUPLEX 850mm

299A/C3

SHT.298
DWG.CD–XXXXXX,
SH.XXX

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AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/00

JOB ORDER NO. S-13656

REV. NO.	DATE	DESCRIPTION
Ø1	13 49	FACTORY ASBUILT
ØØ	13 Ø4	FOR APPROVAL

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.Ø1.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

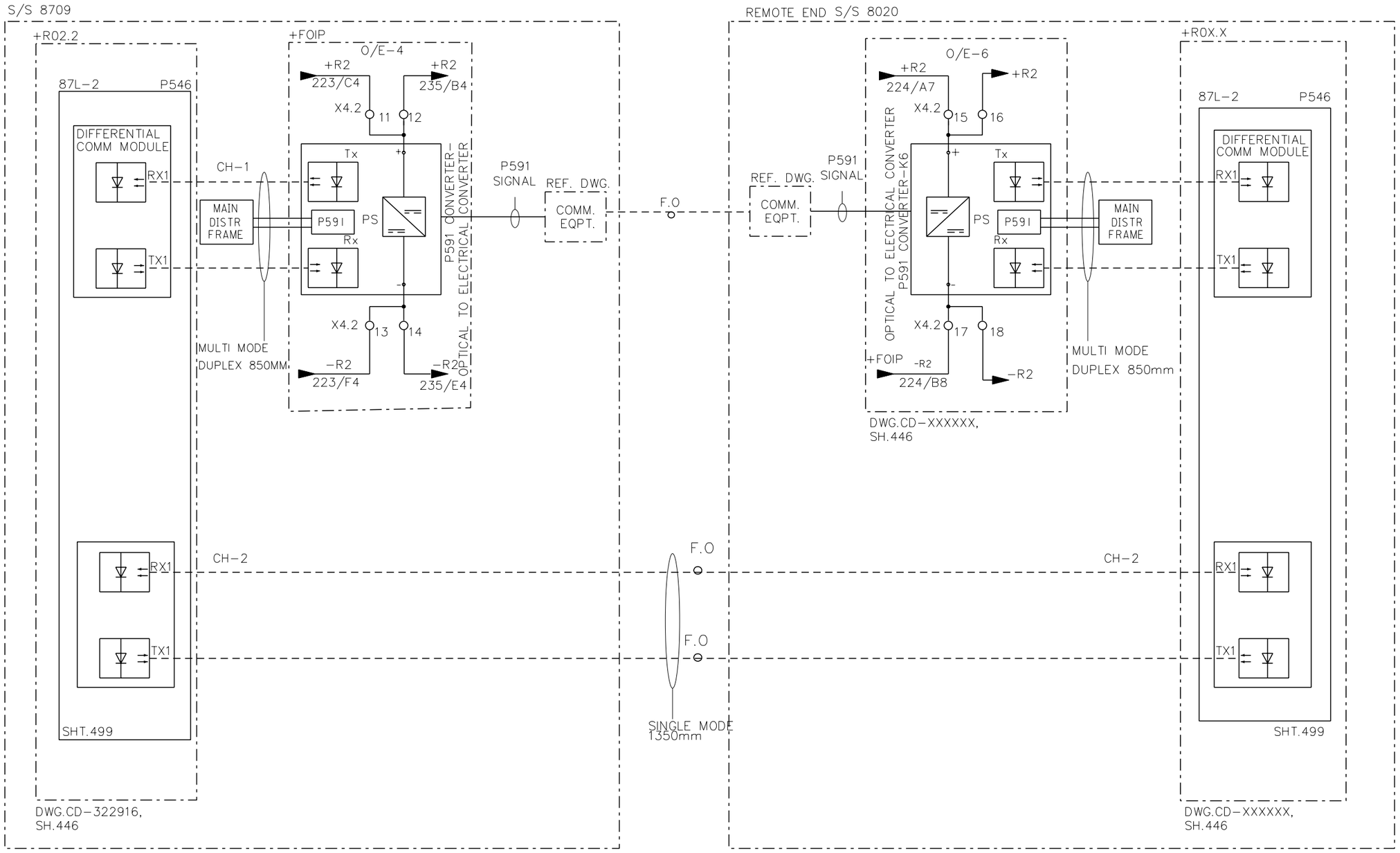
COMMUNICATION INTERFACE-UGF 8020
132kV FIBER OPTIC PANEL +FOIP
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
نقل الكهرباء
National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323Ø12	223	224	Ø1

NG/D2-D (2012/Ø1)
DMS VECTOR NGD2ØØ

CABLE DIS/DEF. PROTECTION
COMMUNICATION INTERFACE



REV. NO.	DATE	DESCRIPTION
Ø1	13 49	FACTORY ASBUILT
ØØ	13 04	FOR APPROVAL

AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/ØØ

JOB ORDER NO. S-13656

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.Ø1.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

COMMUNICATION INTERFACE-UGF 8Ø2Ø

132kV FIBER OPTIC PANEL +FOIP

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

نقل الكهرباء National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323Ø12	224	225	Ø1

NG/D2-D (2Ø12/Ø1)

DMS VECTOR NGD2ØØ

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CABLE DIFFL. PROTECTION
COMMUNICATION INTERFACE

S/S 8709

+R07.1
87L-1 RED670

RX1
TX1
RX2
TX2

SHT.298
DWG.CD-322922, SH.246

MULTI MODE DUPLEX 850mm

CH-2
MDF

+FOIP
O/E-5

+R3 216/C8
+R3 226/A3

X4.3 5 6

O/E CONV.
Tx
Rx
O/ECONV.
PS
(G703)

X4.3 7 8

-R3 216/C8
-R3 226/C3

OPTICAL TO ELECTRICAL CONVERTER

G.703 SIGNAL
REF. DWG. COMM. EQPT.

F.O
F.O
SINGLE MODE 1350mm
F.O

REMOTE END S/S XXXX

REF. DWG. COMM. EQPT.
G.703 SIGNAL

+FOIP
O/E-7

+R3 226/A7
+R3 226/C7

X4 5 6
X4 7 8

O/E CONV.
Tx
Rx
O/ECONV.
PS
(G703) K7

OPTICAL TO ELECTRICAL CONVERTER

CH-2
MDF

MULTI MODE DUPLEX 850mm

DWG.CD-XXXXXX, SH.XXX

+R0X.X
87L-I RED670

RX1
TX1
TX2
RX2

299A/C3

SHT.298
DWG.CD-XXXXXX, SH.XXX

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AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/00

JOB ORDER NO. S-13656

REV. NO.	DATE	DESCRIPTION
01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.01.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

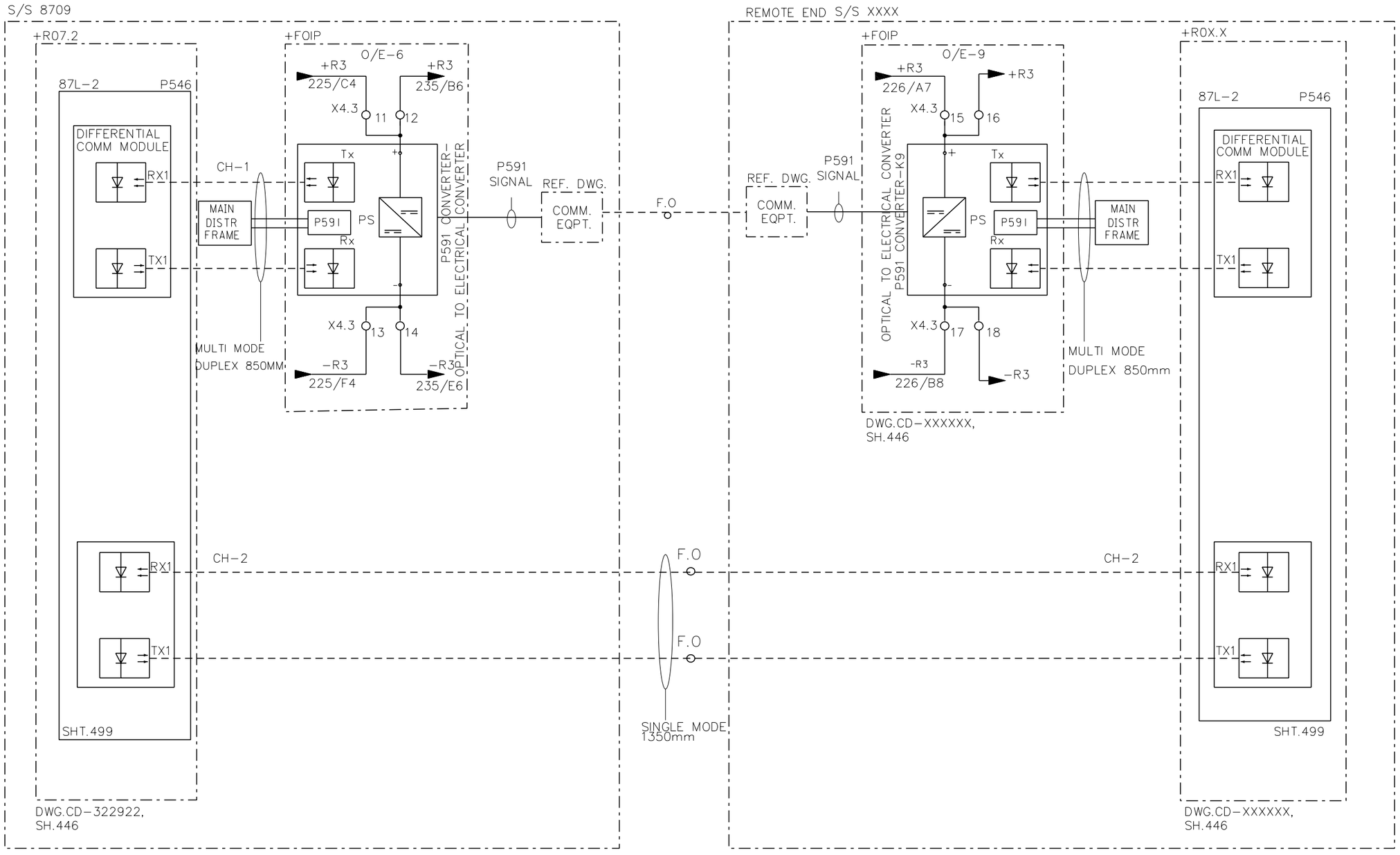
COMMUNICATION INTERFACE-UGF SPARE-A
132kV FIBER OPTIC PANEL +FOIP
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
نقل الكهرباء
National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323012	225	226	01

NG/D2-D (2012/01)
DMS VECTOR NGD200

CABLE DIS/DEF. PROTECTION
COMMUNICATION INTERFACE



REV. NO.	DATE	DESCRIPTION
01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL

AS-BUILT BY _____ DATE _____ | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.01.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

COMMUNICATION INTERFACE-UGF SPARE-A
132kV FIBER OPTIC PANEL +FOIP
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

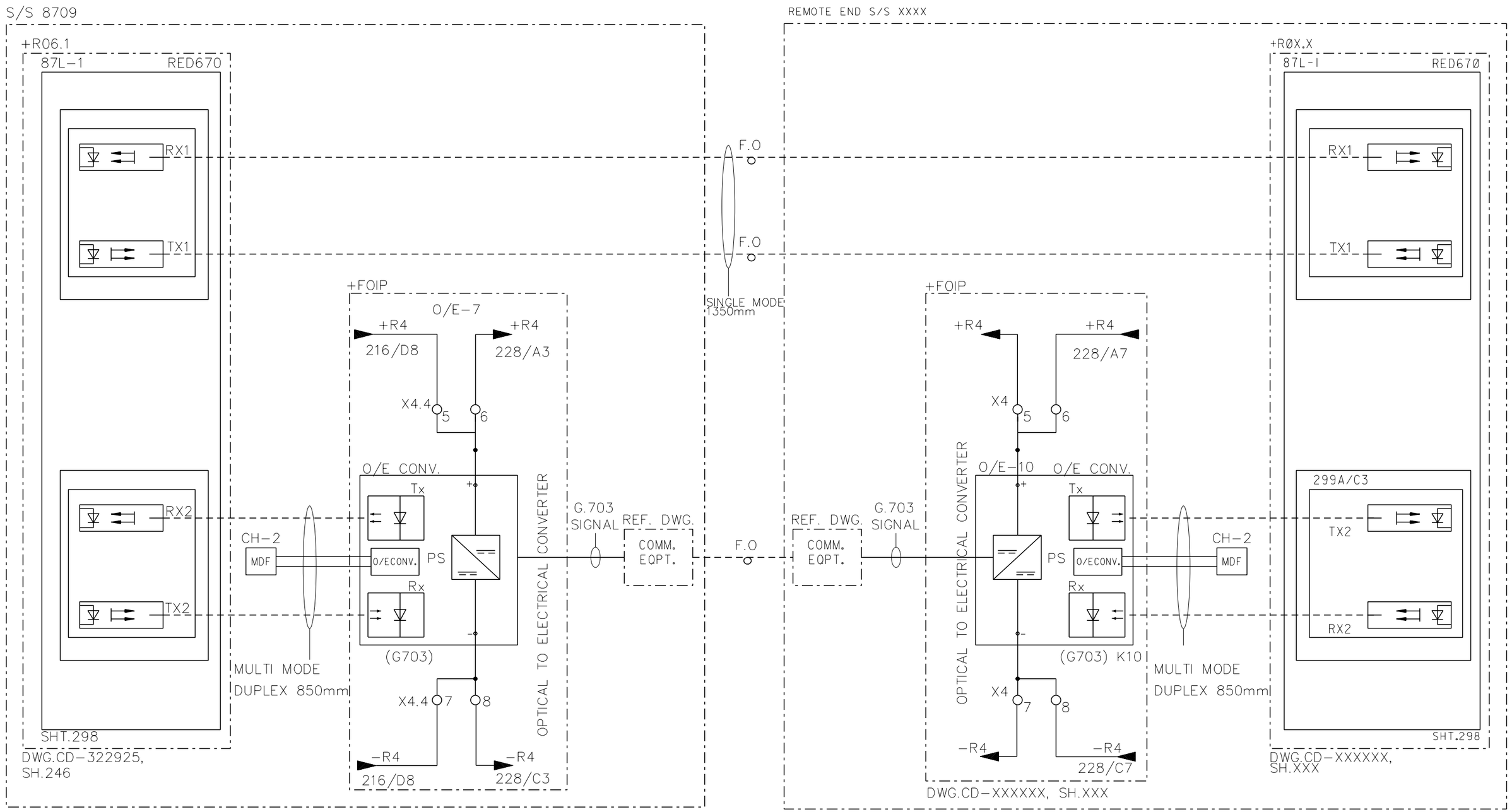
الشركة الوطنية لنقل الكهرباء
نقل الكهرباء
National Grid SA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323012	226	227	01

NG/D2-D (2012/01)
DMS VECTOR NGD200

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CABLE DIFFL. PROTECTION
COMMUNICATION INTERFACE



REV. NO.	DATE	DESCRIPTION
Ø1	13 49	FACTORY ASBUILT
ØØ	13 Ø4	FOR APPROVAL

AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/ØØ

JOB ORDER NO. S-13656

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.Ø1.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

COMMUNICATION INTERFACE-UGF SPARE-B
132kV FIBER OPTIC PANEL +FOIP
S/S 87Ø9 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء
نقل الكهرباء
National Grid SA

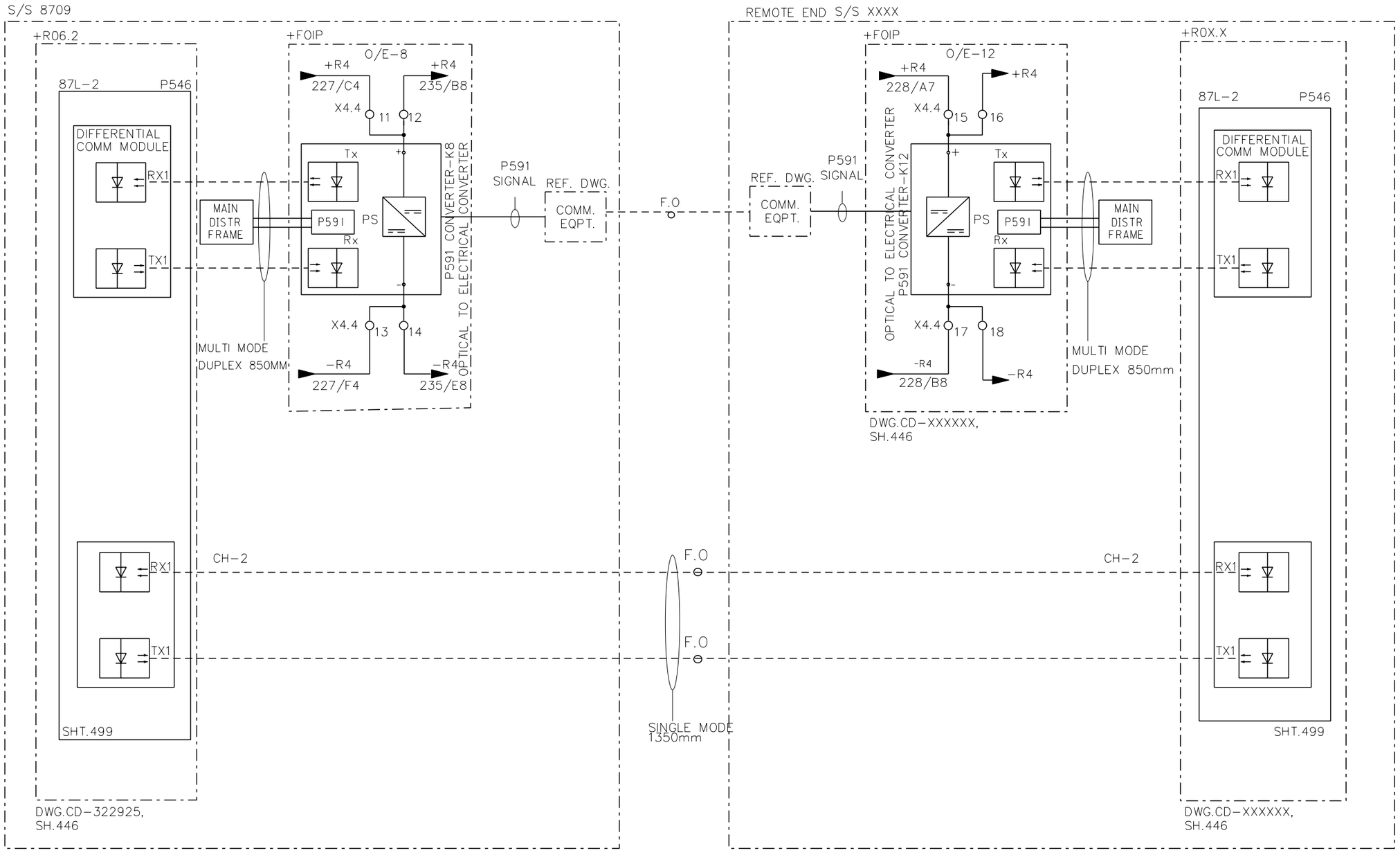
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323Ø12	227	228	Ø1

NG/D2-D (2Ø12/Ø1)
DMS VECTOR NGD2ØØ

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CABLE DIS/DEF. PROTECTION

COMMUNICATION INTERFACE



AS-BUILT BY _____ DATE _____	CONTRACT NO. 11131113/00	JOB ORDER NO. S-13656

REV. NO.	DATE	DESCRIPTION
01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.01.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

COMMUNICATION INTERFACE-UGF SPARE-B

132kV FIBER OPTIC PANEL +FOIP

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

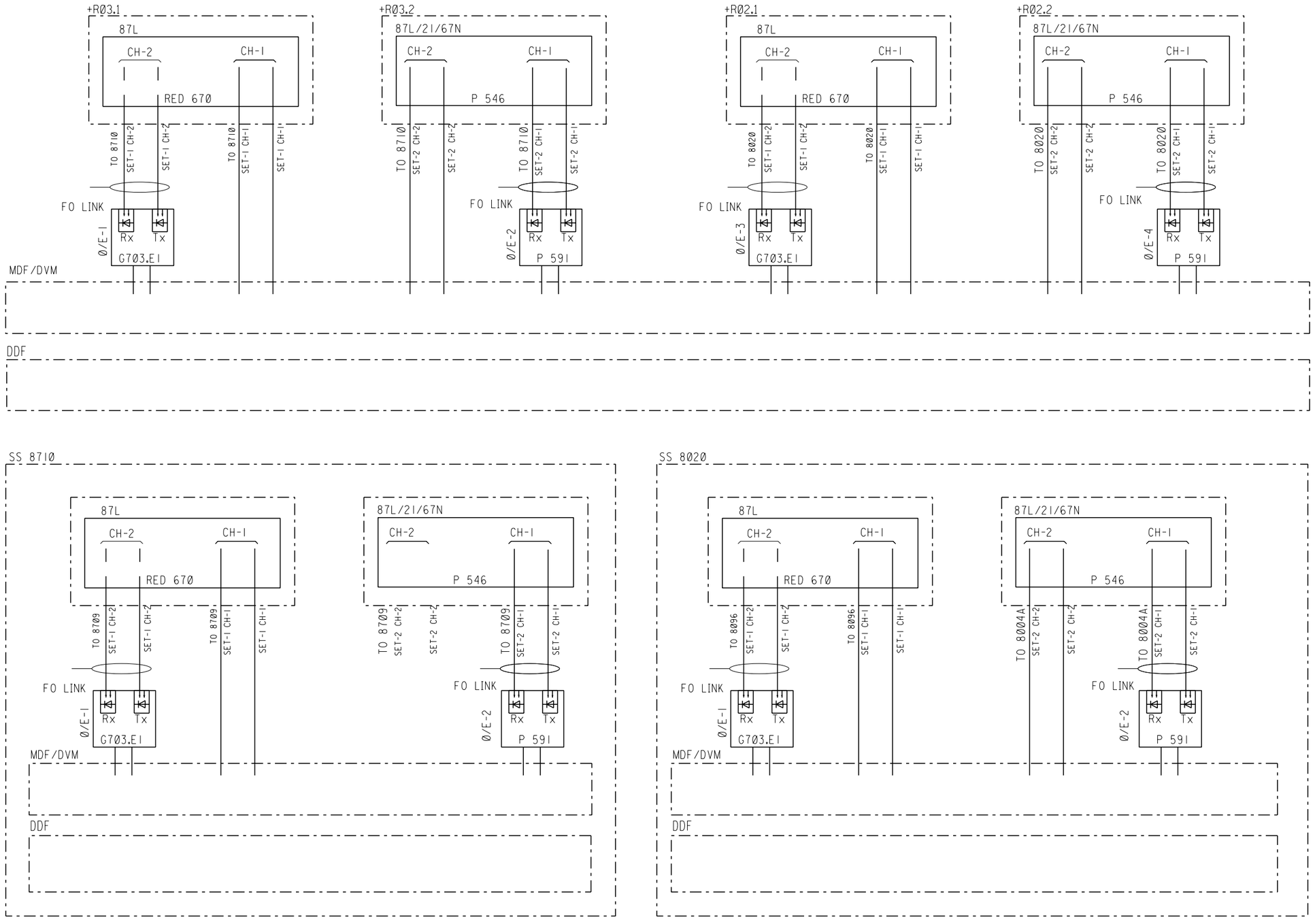
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INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323012	228	229	01

NG/D2-D (2012/01)

DMS VECTOR NGD200

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AS-BUILT BY _____ DATE _____	CONTRACT NO. 11131113/00	JOB ORDER NO. S-13656

REV. NO.	DATE	DESCRIPTION
Ø1	13 49	FACTORY ASBUILT
ØØ	13 04	FOR APPROVAL

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.Ø1.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

COMMUNICATION INTERFACE-UGF 8710 & 8020

132kV FIBER OPTIC PANEL +FOIP

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

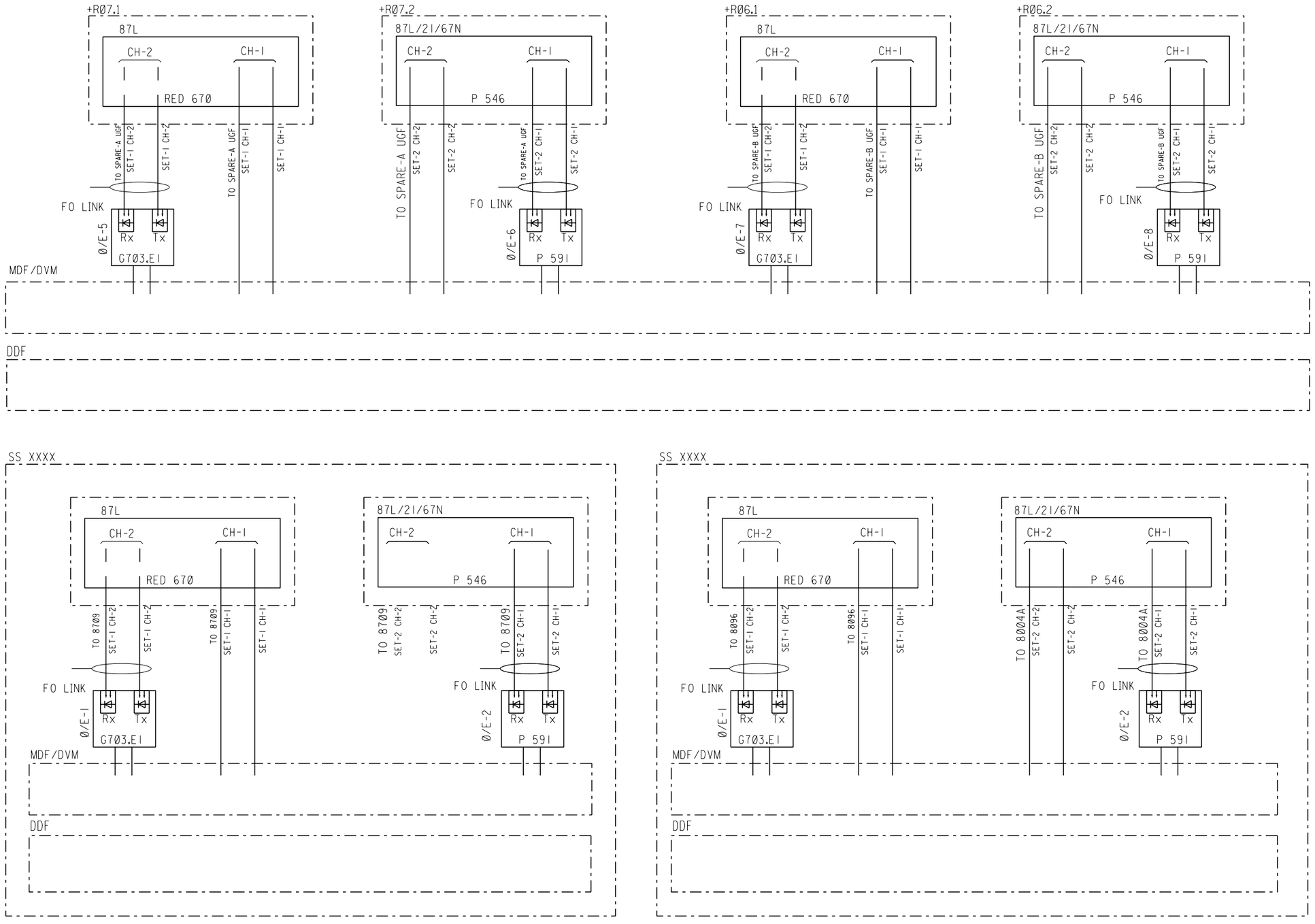
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INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323012	229	230	Ø1

NG/D2-D (2012/Ø1)

DMS VECTOR NGD200

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AS-BUILT BY _____ DATE _____	CONTRACT NO. 11131113/00	JOB ORDER NO. S-13656

REV. NO.	DATE	DESCRIPTION
Ø1	13 49	FACTORY ASBUILT
ØØ	13 04	FOR APPROVAL

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.Ø1.2Ø13 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

COMMUNICATION INTERFACE-UGF SPARE-A & SPRAE-B

132kV FIBER OPTIC PANEL +FOIP

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

نقل الكهرباء National Grid SA

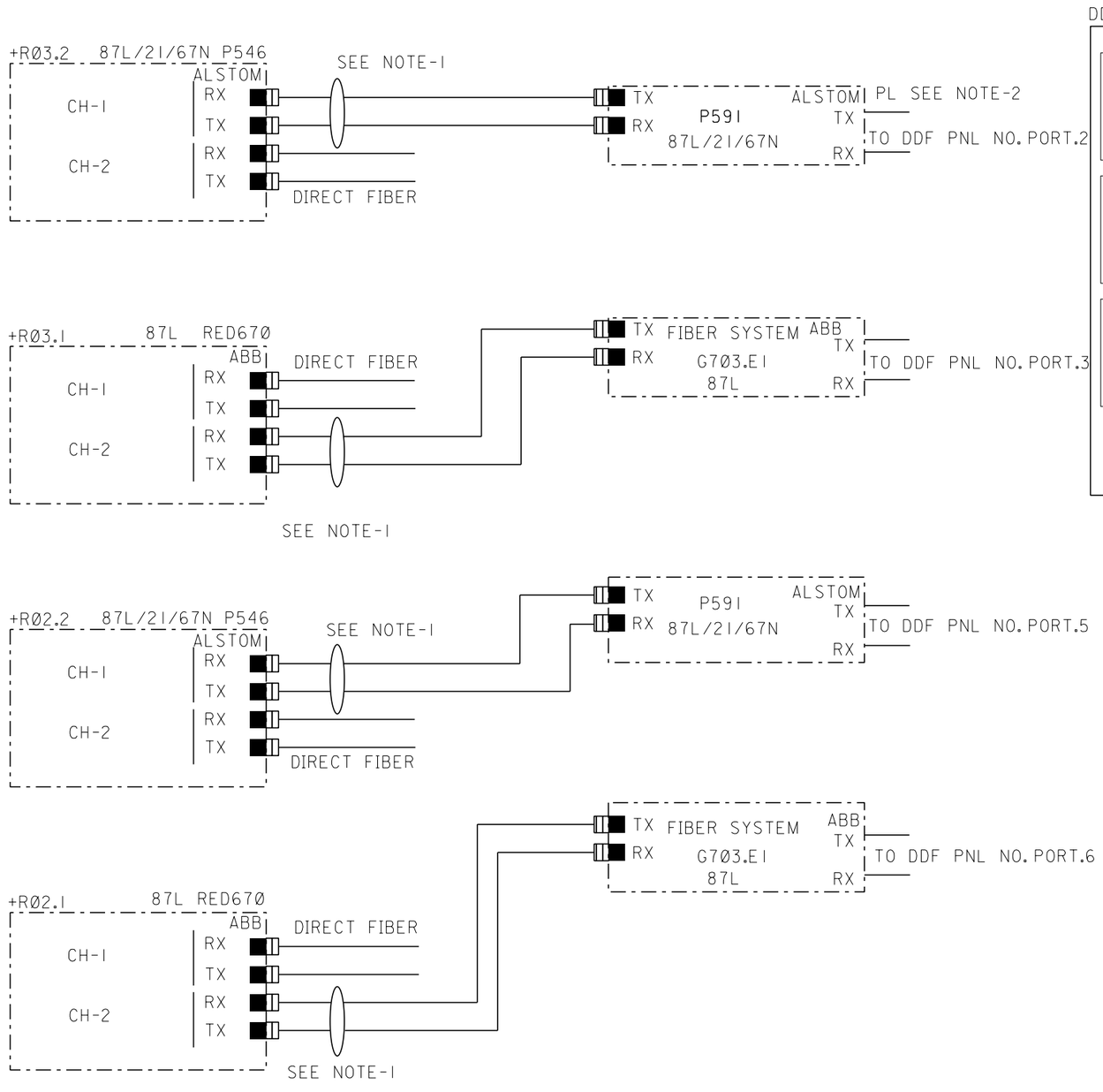
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323Ø12	23Ø	231	Ø1

NG/D2-D (2Ø12/Ø1)

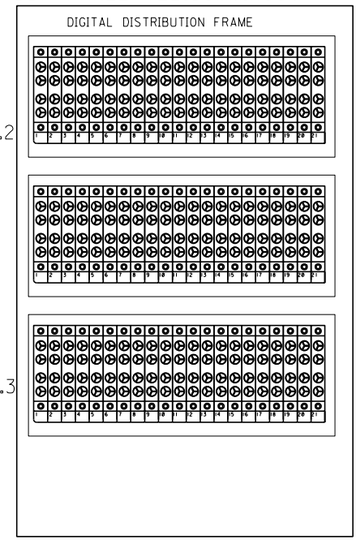
DMS VECTOR NGD2ØØ

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TELECOMMUNICATION ROOM



DDF PANEL TEL.COMM.ROOM



**

1.FIBER OPTIC CABLE BETWEEN RELAY PANEL AND MCP END TO END CONNECTORS ARE 5T TYPE MULTIMODE

2.COAXIAL CABLE BETWEEN MCP AND DDF, INTERCONNECTING CABLES ARE 75 OHMS CO-AXIAL CONNECTORS AT DDF END.

3.APPROXIMATE FIBER OPTIC CABLE LENGTH IS 40 METER PER CHANNEL

4.APPROXIMATE CO-OXIAL CABLE LENGTH IS 10 METER PER CHANNEL

5.TERMINATION ON NEW DDF RACK IN THE EXISTING DDF PANEL WILL BE DECIDED AT SITE.

6.CONNECTOR TYPE:

A)SMB (M) CONNECTOR AT AREVA MEDIA CONVERTER

B)75OHM DIA 0.45/2IM CO-AXIAL CONNECTER AT DDF END

ALL ABOVE MENTIONED POINTS ARE HIGH LIGHTED AS PER M/S SEC REQUEST FOLLOWING INTIMATIONS FROM MAIN CONTRACTOR THAT SAME AS UNDER MAIN/CABLE CONTRACTOR SCOPE OF WORK

REV. NO.	DATE	DESCRIPTION
01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL

AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/00

JOB ORDER NO. S-13656

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.01.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

MEDIA CONVERTER ROUTING CABLE FORM-UGF 8710 & 8020

132kV FIBER OPTIC PANEL +FOIP

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

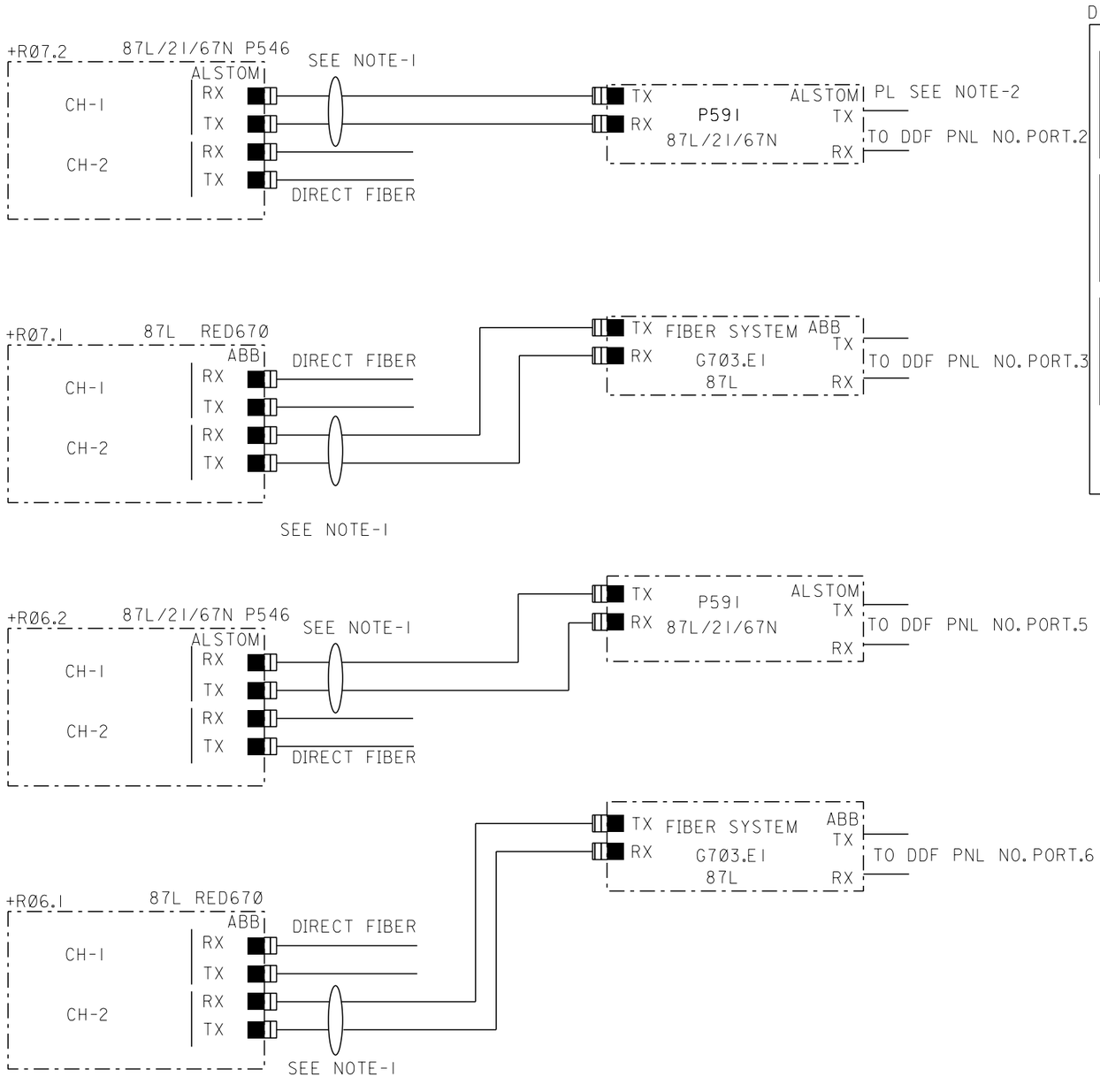
الشركة الوطنية لنقل الكهرباء

نقل الكهرباء National Grid SA

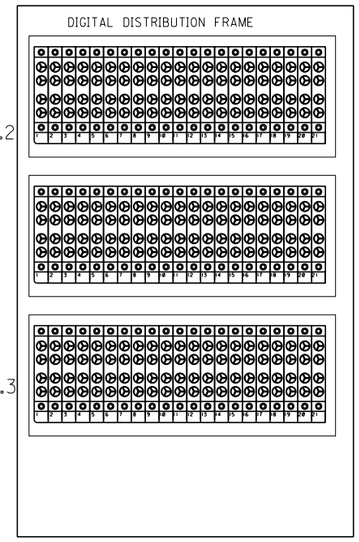
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323012	233	234	01

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TELECOMMUNICATION ROOM



DDF PANEL TEL.COMM.ROOM



**

1. FIBER OPTIC CABLE BETWEEN RELAY PANEL AND MCP END TO END CONNECTORS ARE 5T TYPE MULTIMODE

2. COAXIAL CABLE BETWEEN MCP AND DDF, INTERCONNECTING CABLES ARE 75 OHMS CO-AXIAL CONNECTORS AT DDF END.

3. APPROXIMATE FIBER OPTIC CABLE LENGTH IS 40 METER PER CHANNEL

4. APPROXIMATE CO-OXIAL CABLE LENGTH IS 10 METER PER CHANNEL

5. TERMINATION ON NEW DDF RACK IN THE EXISTING DDF PANEL WILL BE DECIDED AT SITE.

6. CONNECTOR TYPE:

 A) SMB (M) CONNECTOR AT AREVA MEDIA CONVERTER

 B) 75ØHM DIA Ø.45/21M CO-AXIAL CONNECTER AT DDF END

ALL ABOVE MENTIONED POINTS ARE HIGH LIGHTED AS PER M/S SEC REQUEST FOLLOWING INTIMATIONS FROM MAIN CONTRACTOR THAT SAME AS UNDER MAIN/CABLE CONTRACTOR SCOPE OF WORK

REV. NO.	DATE	DESCRIPTION
Ø1	13 49	FACTORY ASBUILT
ØØ	13 04	FOR APPROVAL

AS-BUILT BY _____ DATE _____ | CONTRACT NO. 11131113/ØØ | JOB ORDER NO. S-13656

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.Ø1.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

MEDIA CONVERTER ROUTING CABLE FORM-UGF SPARE-A & B

132kV FIBER OPTIC PANEL +FOIP

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

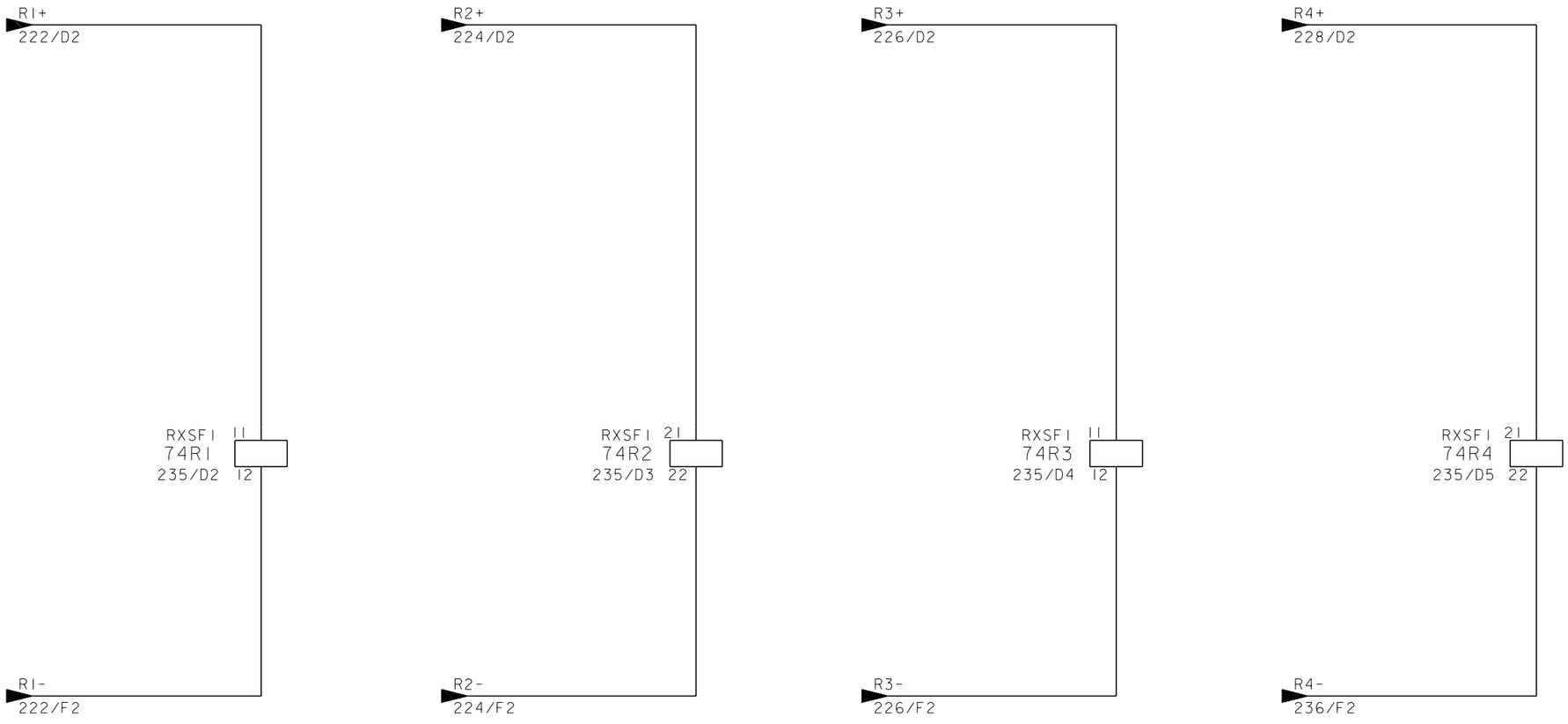
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INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323Ø12	234	235	Ø1

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1	2	3	4	5	6	7	8	9	10
	74F1 DC SUPVN.		74F2 DC SUPVN.		74F3 DC SUPVN.		74F4 DC SUPVN.		



74R1			
11	12	235/C2	
13	14	SPARE	
15	16	236/B3 TO COMMON ALARM	
17	18	SPARE	

74R2			
21	22	235/C3	
23	24	SPARE	
25	26	236/B3 TO COMMON ALARM	
27	28	SPARE	

74R3			
11	12	235/C4	
13	14	SPARE	
15	16	236/B4 TO COMMON ALARM	
17	18	SPARE	

74R4			
21	22	235/C5	
23	24	SPARE	
25	26	236/B4 TO COMMON ALARM	
27	28	SPARE	

AS-BUILT BY _____ DATE _____ | CONTRACT NO. 11131113/00 | JOB ORDER NO. S-13656

REV. NO.	DATE	DESCRIPTION
01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL

DRAWN BY RIZ CHECKED BY KVR
DATE STARTED 24.01.2013 DATE COMPLETED _____
OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

DC SUPPLY SUPERVISION CIRCUIT
132kV FIBER OPTIC PANEL +FOIP
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY
RIYADH SAUDI ARABIA

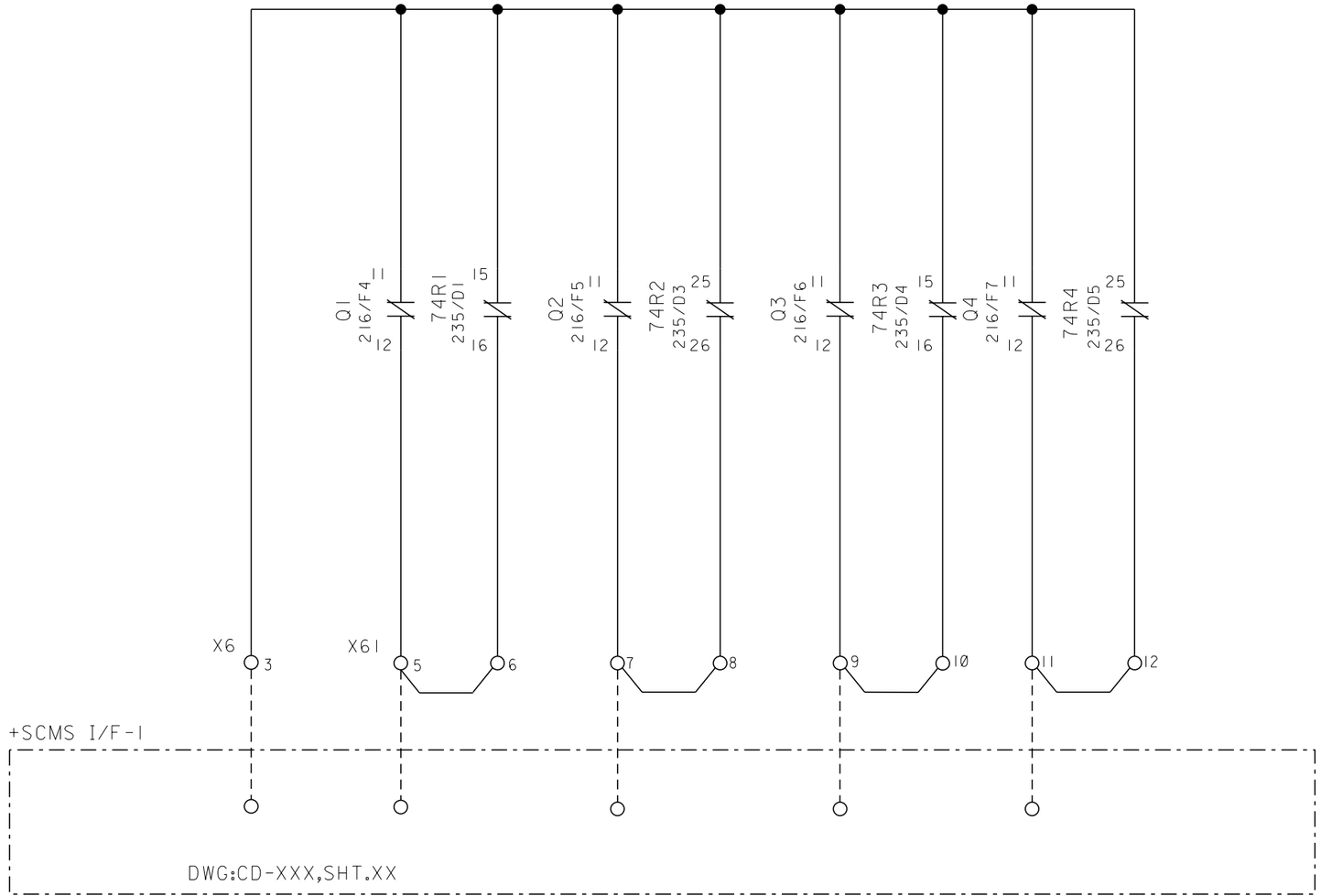
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INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323012	235	236	01

NG/D2-D (2012/01)
DMS VECTOR NGD200

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1	2	3	4	5	6	7	8	9	10
			74R1 DC FAIL	74R2 DC FAIL		74R3 DC FAIL	74R4 DC FAIL		



REV. NO.	DATE	DESCRIPTION
01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL

AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/00

JOB ORDER NO. S-13656

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 24.01.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

COMMON ALARM CONTACTS

132kV FIBER OPTIC PANEL +FOIP

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

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INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323012	236	301	01

NG/D2-D (2012/01)

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REFERENCE	X3 AC CKTS.
211/A3	1
211/B3	2
211/A3	3
211/B3	4
211/B3	5
211/C3	6
211/B3	7
211/C3	8
SPARE	9
SPARE	10

REFERENCE	XTJ TJ
211/C3	1
211/D3	2
211/D3	3
211/D3	4
SPARE	5

REFERENCE	X4.3 DC CKTS.
216/C3	1
216/C3	2
SPARE	3
SPARE	4
225/D3	5
225/D4	6
225/F3	7
221/F4	8
SPARE	9
SPARE	10
226/D3	11
226/D4	12
226/F3	13
226/F4	14
SPARE	15
SPARE	16
SPARE	17
SPARE	18
SPARE	19
SPARE	20

REFERENCE	X4.4 DC CKTS.
216/D3	1
216/D3	2
SPARE	3
SPARE	4
227/D3	5
227/D4	6
227/F3	7
227/F4	8
SPARE	9
SPARE	10
228/D3	11
228/D4	12
228/F3	13
228/F4	14
SPARE	15
SPARE	16
SPARE	17
SPARE	18
SPARE	19
SPARE	20

REFERENCE	XSH SPACE HEATER
211/E7	1
211/E7	2
SPARE	3

REFERENCE	X6 COMMON ALARM
212/B4	1
212/B5	2
236/E3	3
SPARE	4
SPARE	5

REFERENCE	X4.1 DC CKTS.
216/A3	1
216/A3	2
SPARE	3
SPARE	4
221/D3	5
221/D4	6
221/F3	7
221/F4	8
SPARE	9
SPARE	10
222/D3	11
222/D4	12
222/F3	13
222/F4	14
SPARE	15
SPARE	16
SPARE	17
SPARE	18
SPARE	19
SPARE	20

REFERENCE	X4.2 DC CKTS.
216/B3	1
216/B3	2
SPARE	3
SPARE	4
223/D3	5
223/D4	6
223/F3	7
223/F4	8
SPARE	9
SPARE	10
224/D3	11
224/D4	12
224/F3	13
224/F4	14
SPARE	15
SPARE	16
SPARE	17
SPARE	18
SPARE	19
SPARE	20

REFERENCE	X61 COMMON ALARM
212/E4	1
212/E5	2
SPARE	3
SPARE	4
236/E4	5
236/E4	6
236/E5	7
236/E5	8
236/E6	9
236/E6	10
236/E7	11
236/E7	12
SPARE	13
SPARE	14
SPARE	15

AS-BUILT BY _____ DATE _____

CONTRACT NO. 11131113/00

JOB ORDER NO. S-13656

REV. NO.	DATE	DESCRIPTION
01	13 49	FACTORY ASBUILT
00	13 04	FOR APPROVAL

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DATE STARTED 24.01.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

TERMINAL BLOCKS

132kV FIBER OPTIC PANEL +FOIP

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

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INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT	SHEET NO. CONT.	REV. NO.
-	C421	CD-323012	301	NIL	01

NG/D2-D (2012/01)

DMS VECTOR NGD200

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